FEBRUARY 14, 1955

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Tell the world . . .

about what you make

page 73

No. 1 in 1955 Management Series

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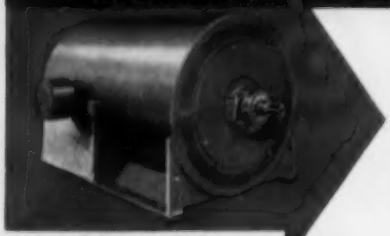
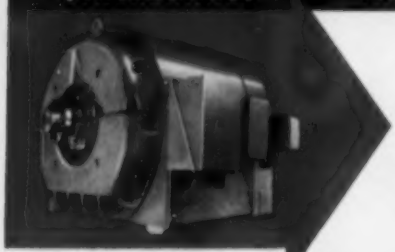
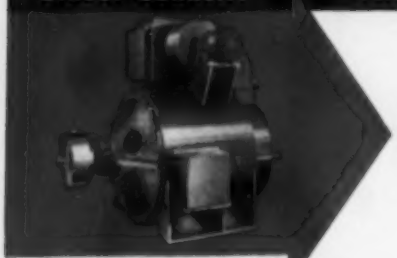
ALLIS-CHALMERS

Large MOTORS

Choose the Exact Motor You Need

INDUCTION	Performance Characteristics	Protection	Applications
 Tube-type TEFC squirrel-cage motor	Single or multi-speed. Wound-rotor design for variable speed operation. Available with low starting current, high starting torque and other special characteristics.	Open; drip-proof; splash-proof or weather-protected; enclosed, self or forced-ventilated; totally-enclosed, fan-cooled; totally-enclosed, water-cooled; explosion-proof.	Fans, blowers, machine tools, pumps, material handling and auxiliary equipment, compressors, m-g sets, general purpose use. Wound-rotor for variable speed where speed range is not too great.

SYNCHRONOUS	Performance Characteristics	Protection	Applications
 Drip-proof synchronous	Constant speed under all load conditions. Excellent for low speed. High efficiency under all loads. Unity or leading power factor.	Open; drip-proof; splash-proof or weather-protected; enclosed, self or forced-ventilated; totally-enclosed, fan-cooled; totally-enclosed, water-cooled; explosion-proof.	Can be used for almost any type of constant speed drive. Frequently used where power factor correction is necessary.

DIRECT-CURRENT	Performance Characteristics	Protection	Applications
 Force-ventilated dc motor	Stepped or stepless wide range speed variation. Reversing or non-reversing. Dynamic or regenerative braking.	Open; protected; drip-proof; splash-proof; forced-ventilated from attached or separate blower; enclosed, water-cooled.	Rolling mills, processing lines, wire mills, machine tools, and other machines requiring wide range of speed adjustment with constant and variable torque and horsepower.

BECAUSE ALLIS-CHALMERS BUILDS A COMPLETE LINE of motors for the metal industries, you can select exactly the performance characteristics and protection you need.

For more information or for engineering assistance, call your nearby A-C District Office or write for bulletins on motors you need. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4571

Send for this free engineering information:

Open motors Larger sizes	Open motors NEMA sizes
0587542 5187693 0588123 0587771	5186210
Enclosed motors Larger sizes	**TEFC motors NEMA sizes**
0587150 0588189 0587682	5187225 5187286
Synchronous motors	**Direct-current motors**
0588123 0587648 0587649	0586002

ALLIS-CHALMERS

Steelwork for giant Ford plant bolted in 78 working days

The old adage, "now you see it, now you don't," worked in reverse recently at Ford's new assembly plant at Mahwah, N. J. For the steelwork for this huge structure, the largest Ford assembly plant ever constructed, was erected in only 78 working days.

The one-story mill-type structure is 2115 ft long and 790 ft wide, and ranges in height from 25 ft to 31 ft. Its total layout covers an area of 1,800,000 sq ft. Its steel framework, weighing 9600 tons, is bolted with nearly 250,000 Bethlehem bolts, including approximately 150,000 high-strength bolts.

Bethlehem High-Strength Bolts make possible a saving in erection time because they can be installed quickly by a two-man crew. The hexagonal-head bolts are inserted with two hardened washers, one under the head, the other under the hexagonal nut. Then the nut is tightened to predetermined torque with an air-powered impact wrench, so that it stays tight indefinitely.

Bethlehem High-Strength Bolts are furnished in carbon steel in all sizes from ½ in. to 1¼ in., and in varying lengths. They are heat-treated by quenching and tempering, and meet all the requirements of ASTM Specification A-325.

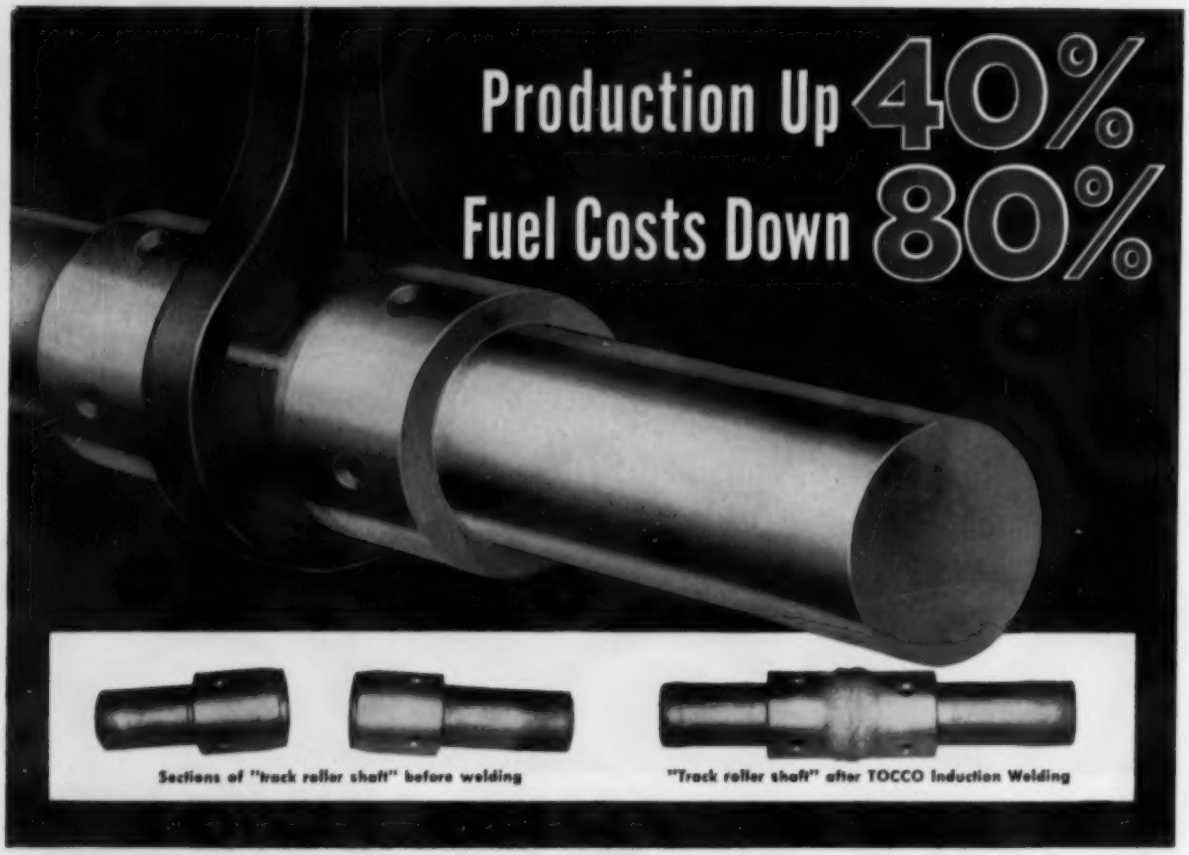
Whether or not you have immediate construction in mind, you'll want to look into the saving in erection time made possible by the use of Bethlehem High-Strength Bolts. The nearest Bethlehem office is at your service.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Bethlehem High-Strength Bolts

BETHLEHEM STEEL


Production Up 40%
Fuel Costs Down 80%
Sections of "track roller shaft" before welding
"Track roller shaft" after TOCCO Induction Welding

with TOCCO* Induction Welding

Here's the story of how one company, a large manufacturer of automotive equipment and farm implements, is using TOCCO Induction Heating to increase production and effect substantial savings at the same time.

Production Increased

When TOCCO Induction Heating replaced oxy-acetylene, output of these hollow "track roller shafts" went up from 220 to 300 pieces per 8 hour shift. The heating cycle with TOCCO is only 55 seconds as opposed to 90 seconds formerly required with gas. Result: much lower labor cost per unit.

Fuel Savings

Fuel costs nosedived from $10.50 per hundred pieces to only $1.95—about $25 per shift saved on fuel costs alone. Other important savings have resulted from a substantial reduction in down time and maintenance costs. Quality of the weld is more uniform with Induction, and hazards of explosion present with former method are eliminated.

If the manufacture of your product involves welding, heat treating, forging, brazing or the melting of ferrous or non-ferrous metals, don't overlook TOCCO as a sound method of increasing production, improving product quality and slashing costs.

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Dept. S-2, Cleveland 1, Ohio

Please send copy of "TOCCO Induction Heating."

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Position_____

Company_____

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City_____ Zone___ State_____

Fork truck with built-in lasso ... for cowboy drivers

● Over-enthusiastic truck jockeys can't hurt Baker Fork Trucks or loads carried (or themselves) by jumping from "low" to "high" or forward to reverse.

Baker drum-type controllers take motor speed in successive steps through acceleration stages, no matter how "heavy" the foot on the accelerator.

Jack-rabbit starts, with resulting motor burnouts, are impossible. Dynamic braking slows truck to a smooth stop, sparing driver and load, and acts as auxiliary brake on steep grades.

Motor strain or jolt from sudden direction changes is prevented by requiring truck to come to a virtual stop before reversing circuit applies.

All this adds up to safer operation for driver, truck and load, less down time, lower repair bills and longer truck life.

For more detailed information on Baker Fork Truck features, write for 4-color sketch book —Bulletin 64. The BAKER-RAULANG Company, 1259 West 80th Street, Cleveland 2, Ohio.

Baker.
industrial trucks

Added Evidence that . . .

Everyone Can Count on VEEDER-ROOT

In figuring out new systems of automatic electrical control, Veeder-Root *Count*rol can supply vital connecting links. For instance, this Predetermining Counter can be hooked into such a system to light a light, ring a bell, or actuate a mechanism to stop a machine or process *at any pre-set point.* And there are many other Veeder-Root Counters that can serve as "countponents" in almost any way desired. Or special counters can be designed for specific applications. Engineers in any industry, now engaged in working out automatic control systems, can count on Veeder-Root engineers to work with them on any problem where reliable facts-in-figures are needed.

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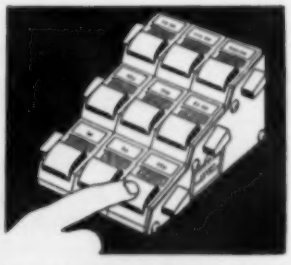
"The Name That Counts"



New *Vary-Tally* Multiple-Unit Reset Counter comes in any combination up to 6 banks high, and 12 units wide Write for news sheet and prices.

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING
Vol. 136 No. 7 February 14, 1955

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Added efficiency and new equipment help most manufacturers have a good year despite keener competition

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Combining Business with World Politics 43
U.S. industry asked to work with government in foreign trade fairs to build business, counteract Red propaganda

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Only a legal mind can understand the maze of confusing local tax laws facing metalworking companies today

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More sinter in ore burden ups output, lowers coke consumption, leads to a corresponding decrease in flue dust

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METALLURGISTS • ENGINEERS • MANUFACTURERS

BRIDGEPORT (Montgomery County) PA

behind the scenes

Birth of Rooster

When Copy Editor Harry Chandler's Program for Management story "Product Communication" fell into the hands of STEEL artist Tom Bryan the result was a rooster—that big black fellow you saw strutting on the cover. "If the story," said Tom, "is worth crowing about, let's crow about it." So that's why this week 138,000 readers of STEEL will find themselves staring at a sooty barnyard fowl. Tom took more anatomical liberties with his dusky rooster than a Darwin would dare imagine, but he figured correctly that metalworking management would be more interested in the story the rooster was crowing about than in a designer's conception of ornithological assembly.

The story is the result of much thought and research. Harry had been turning the idea over in his mind for about six months; he clipped items from national business publications, took notes at conventions, listened carefully at sales meetings. He traveled thousands of miles to gather additional material, interviewed executives of dozens of great plants and organizations, and assembled enough notes to fill a book. On his return he interviewed George Hays, President, Penton Publishing Co., publishers of STEEL. Mr. Hays' influence extends far beyond the company he so efficiently heads. Among his contemporaries his views on product communication are widely respected, so in his final interview Harry wasn't sure who was interviewing whom.

How product communication paves way for greater sales will lead off STEEL's 1955 Program for Management series. This series brought STEEL first award for editorial achievement in Industrial Marketing's annual competition for industrial papers, and the Chandler story upholds the standards already won.

Oops—Slips!

Notice how we casually tossed in that "whom" a few lines back? Well, letters and phone calls from indignant readers over a boo-boo we pulled recently convinced us that one may play fast and loose with literary quips in these columns only at one's peril. We attributed to Samuel Coleridge a line from Thomas Gray, which proves nothing except that ol' Shrdlu is getting progressively softer in the head; and if anybody ever tells you that STEEL's readers ain't literate, don't you believe it.

H. Clive Morrison, manufacturer's agent, 4211 North Farwell Ave., Milwaukee, Wis., exercised the greatest charity in pinning our ears back. "Tut, tut, and fie on you Mr. Shrdlu," wrote Mr. Morrison, "for crediting to Samuel Coleridge the quotation 'Full many is flower is born to blush unseen,' when you should know that it comes from the much quoted and misquoted poem of Thomas Gray, 'Elegy Written in a Country Churchyard.'

"In a previous item you also refer to Dr. Johnson's classic remark 'Oats is a grain used for horses in England but for people in Scotland.' As a Scotsman I like to think of the reply (whether authentic or not I do not know) which a Scot who was present is alleged to have made: 'Aye, and where does one find better horses or finer men?'"

Carl H. Morken, V.P. and Works Manager, the Kennedy Valve Mfg. Co., Elmira, N. Y., also was kind enough to point out our boner, but then surprisingly attacked the authenticity of the Japanese characters we pictured here Jan. 31. Honest, Mr. Morken, we understand they were copied from a genuine Japanese dictionary, but if you want to argue with the man who assembled them, we'll be glad to turn the matter over to him. As for us, we don't know Hokushu from Kagoshima. (And Mr. Morken could properly add that we don't know Gray from Coleridge, either.)

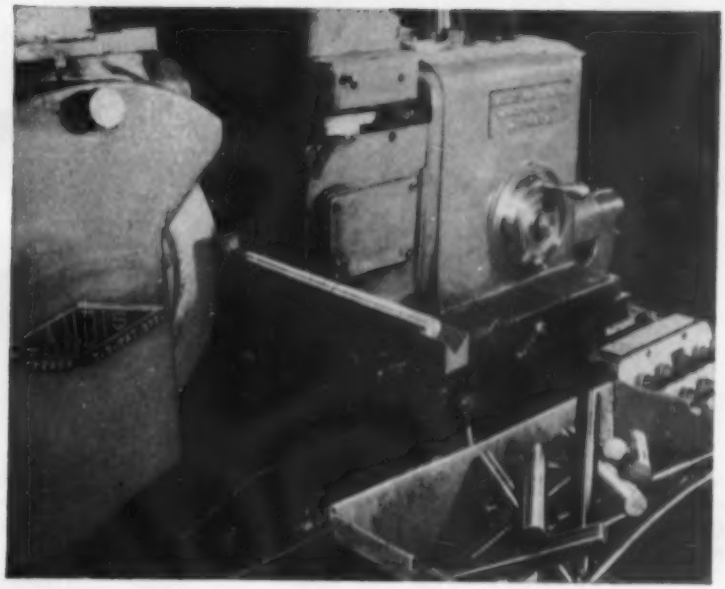
It Must Be Love

In the belief that even in the bosoms of metalworking executives the heart might beat a little faster on St. Valentine's day (today is the 14th, you know) we asked Ambrose the Ambidextrous Office Boy to compose something appropriate for the occasion. He came up with:

When Cupid hits they say his darts burn,
But as for me, they give me heartburn.

Shrdlu

(Metalworking Outlook—Page 27)



Threads 7¼" per Minute by CONTINUOUS GRINDING

LANDIS Centerless Thread Grinders are being used at the Kilbourn Engineering Company in Milwaukee, Wisconsin, to produce continuous threaded studs for high-pressure high-temperature service.

Studs ranging from ⅝" to 1⅜" in diameter are threaded from blanks of SAE 4140 steel heat-treated to a 260-320 Brinell hardness. In the operations illustrated, 1⅛" 8 pitch UN threads must be generated 10" long to a Class 7 fit to meet ASA standards (Manual B1.4). These threads are produced with LANDIS #1 Centerless Thread Grinders by continuous thru-feed grinding at the rate of 7¼ linear inches per minute, *or better.* The excellent quality and smooth finish of the ground thread has reduced final assembly time and minimized galling.

Centerless Thread Grinders, manufactured exclusively by LANDIS, are designed for the high-speed threading of a wide variety of workpieces from 1/16" to 4¾" in diameter. Blanks having one or more diameters, requiring threads on the outer diameter, can be threaded automatically by the thru-feed process used here.

Centerless Thread Grinding, by utilizing the "up-grinding" technique, is also well-adapted for threading workpieces of high hardness and coarse pitch. This process allows up to 30% higher work surface speeds, and often eliminates secondary threading passes required by other methods.

For further information, send specifications and ask for Bulletin E-97.

LANDIS

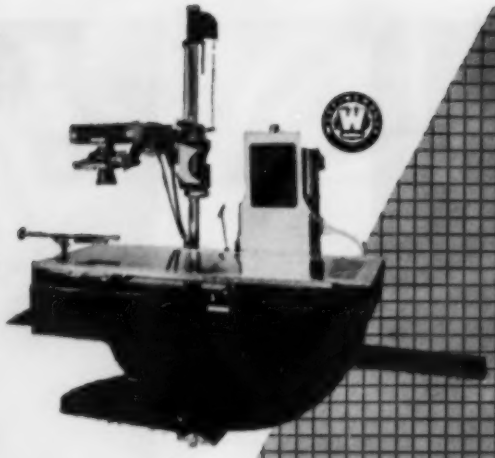
LANDIS *Machine* COMPANY

WAYNESBORO • PENNSYLVANIA • U.S.A.

390

to save a life

X-ray tables require a precision all their own, for smooth, easy positioning. And, if you were to X-ray this Westinghouse Duoflex motor-driven table, you would see Federal Ball Bearings quietly at work here, too.



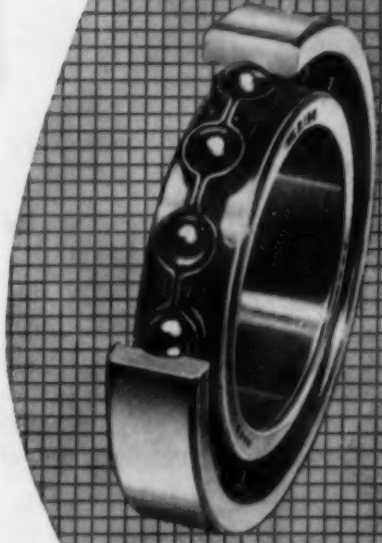
so much of industry *turns* on FEDERAL ball bearings

X-rays or escalators—hum of motors or heft of hoists—in the clinic or machine shop—Federal Ball Bearings do their quiet, anti-friction job. In your office, plant or home, you'll probably find some of the hundreds of types and 12,000 sizes produced by this 50-year-old manufacturer of ball bearings exclusively.

When Federal Ball Bearings are a part of so many things you *use*, shouldn't they be a part of the things you *make*?

175 pages, chock full of data about ball bearings are yours for the asking in FEDERAL's new catalog. Just drop us a line for your copy.

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, N. Y.



or lift a safe

Husky electric hoists—capable of lifting and conveying up to 15 ton loads put a strain on bearings, too. In these mechanical "strong men", too, you'll find Federal Ball Bearings.

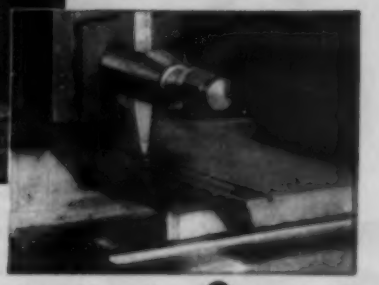
Federal BALL BEARINGS One of America's Largest Ball Bearing Manufacturers

Form Tools

Dies from Templates

Facing 90° shoulders

Duplicating a Cam



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Automatic duplicating of MANY shapes on a Cincinnati Shaper...

Many diversified parts are accurately reproduced at low costs by automatic duplicating on Cincinnati Shapers.

Single point tools—simple low cost sheet metal templates, or the part itself are used to duplicate the piece.

The Shaper is instantly reconverted to standard use when desired.

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Write for Bulletin N-6.

THE CINCINNATI SHAPER CO.

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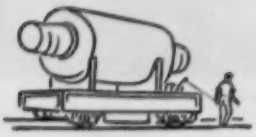
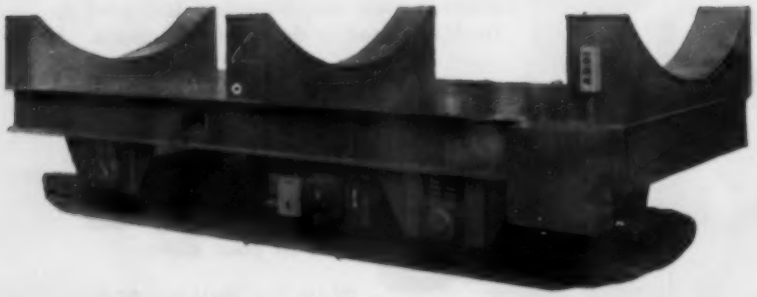


Atlas Safety-Type Transfers provide safe, low-cost service. Available with gas or diesel-electric, cable reel, or storage battery power. Atlas Transfers handle any type of load . . . and the heavier the load, the greater the savings.

20-TON STORAGE BATTERY FLAT CAR



20-TON STORAGE-BATTERY WITH CRADLE FOR PIPE

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

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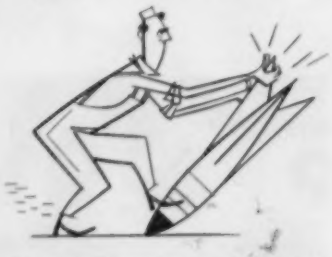
LETTERS TO THE EDITORS

Army Reports on Adhesive



We noticed your article in "Technical Outlook" (Jan. 17, p. 71) in regard to a new adhesive called Araldite 115, developed through Army research. (. . . Araldite 115, used in place of soft solder for bonding galvanized steel screens to cold-rolled steel shrouds in bomb tail fin assemblies, may reduce the cost of the operation 50 per cent.)

We would like further information on this material.

F. M. Nell
Union Steel Products Co.
Albion, Mich.

Do you know who makes such an adhesive? Where can we get some?

Warren C. Long
Clayton Mark & Co.
Evanston, Ill.

We are much interested in this material and would like the name of the manufacturer . . .

S. L. Horton
purchasing agent
Trussbilt Division
Siems Bros. Inc.
St. Paul, Minn.

• *Full information on Araldite 115 is given in the Army research report just made available to industry by the Commerce department's Office of Technical Services. The report, PB 111445, entitled "Investigation of Adhesives: Metal-to-Metal Bonding," is available from OTS, Washington 25, for 25 cents.—ED.*

Announcing a Rebirth

We are particularly impressed with your editorial, "Rebirth of the Salesman" (Jan. 24, p. 35). We would appreciate about 30 tear sheets.

Paul A. Fergus
Jones & Taylor & Associates
South Bend, Ind.

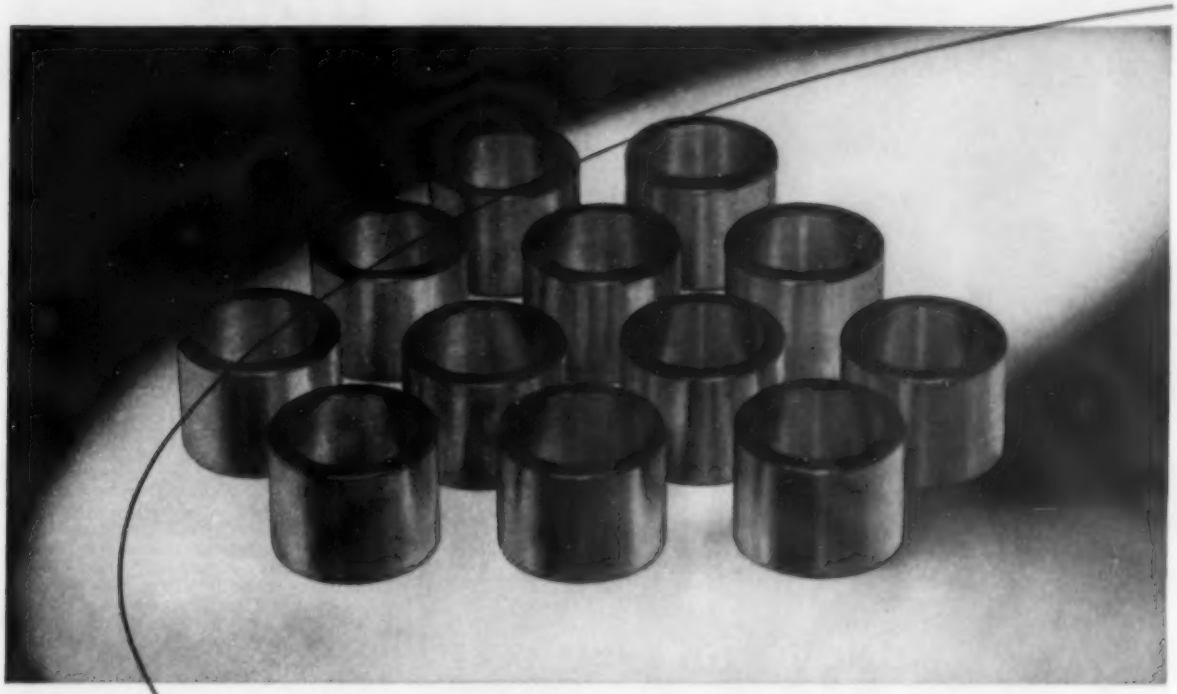
This morning I read your views on the "Rebirth of the Salesman." We would like about 90 copies of this editorial, as we would like all of our salesmen to read your comments.

Lawrence E. Weit
sales manager
Atlas Bolt & Screw Co.
Cleveland

Please send 12 tear sheets . . .

J. Warner Clark
treasurer
Flood Co.
Hudson, O.

(Please turn to page 12)



these requirements in mind...

So varied are the demands on multiple spindle automatics it is impossible to design into one model — or a number of models — all the facilities that will satisfy every requirement. To excel in any range of work the design of a machine of this type must be directed toward that work.

Cone's new General Datalog lists over forty CONOMATIC models that are designed with these requirements in mind. For any range of work, Conomatics are built to more efficiently serve the latest cutting tool materials.

data for comparison

Part	Bushing
Machine	1¼" Six Conomatic
Tools	100% Carbide Tipped
Material	Stainless Steel Tubing
Stock Size	1¼" OD; ¾" ID
R. P. M.	Work Spindle — 1033 Opposed Spindle—1048
Time	7 Seconds per Cycle 3.5 Seconds per Piece

Conomatic} CONE AUTOMATIC MACHINE COMPANY, INC. WINDSOR, VT., U.S.A.

E.W.FERRY SCREW PRODU
You
BELONG IN THIS PICTURE!
We'd like to have you visit us.
And, if you use stainless or alloy steel, brass or bronze fasteners, you'll *enjoy* seeing America's most modern and most efficient fastener plant.
Let us show you how expert plant layout, automatic materials handling and experienced know-how combine to keep our costs down.
That's why the World's Leading Producer of Stainless Steel Screws can sell you PREMIUM QUALITY AT "MARKET" PRICES.
The E. W. FERRY SCREW PRODUCTS Inc.
Smith Road, Brookpark, Cleveland 30, Ohio

LETTERS

(Concluded from page 10)

Savings Overstated

We read with interest the article entitled, "Mathematics Spots Hidden Profits," (Dec. 13, p. 118).

To the best of our knowledge the claims of improvements, savings and results have been considerably overstated, which may or may not have misled your readers. We believe that a visit or call to the firm involved will show that an increase in tube mill production of 1 per cent to 2 per cent was the most that was obtained rather than the 15 per cent increase mentioned in the article. The $350,000 savings cited in the article is an exaggeration that cannot be substantiated either. There has been an improvement to be sure in production and purchasing practices, and the firm is following some of the recommendations set forth in our report. But claims of the kind and character made in the article are a misrepresentation of the results obtained.

R. O. Ferguson
Methods Engineering Council
Pittsburgh

• *On checking with the company we discovered that you're right on both counts. The author, Nyles V. Reinfeld, Executive Services, Cleveland, gave us inaccurate figures for production increase, and the $350,000 represents the optimum saving which, the company advises us, has never been reached.—ED.*

How Wrap-Arounds Are Born

Several of us seem to be much interested in the excellent reporting in your "Mirrors of Motordom" column.

Would it be possible for that reporter (Floyd G. Lawrence, Detroit Editor) to give us a page on how the wrap-around windshields are made? Some enthusiastic salesmen tell us, as automobile buyers, that the windshields are bent after the two parts are cemented to the plastic meat in the sandwich.

John H. Miller
vice president
Weston Electrical Instrument Corp.
Newark, N. J.

• *From a paper on the subject of wrap-around windshields by George B. Watkins, director of research, Libbey-Owens-Ford Glass Co.: ". . . two pieces of selected plate or sheet glass, cut to size, are washed, assembled into a sandwich with a piece of plastic (polyvinyl butyral) as the interlayer, then prepressed through rubber rollers with about 15 lb pressure to remove air and noncondensible gases before loading into an autoclave, where the unit is bonded by heat and pressure applied through the medium of oil." For further details, we suggest you write to Mr. Watkins.—ED.*

IN this cost-conscious era of close competition, there is a constant search for methods to reduce manufacturing costs. One way this is being accomplished by manufacturers of refrigeration equipment . . . is by making full use of the Microhoning process on vital functional surfaces of parts such as the bearing plate, crank case, main frame, front head casting, connecting rod, cast-iron housing, cylinders, pistons, and various small bushings.

What is Microhoning and how does it reduce manufacturing costs?

Microhoning is an abrading process that combines stock removal, geometric accuracy, size control and surface finish into one automatic operation. The rotating and reciprocating, automatically-expanding tool self-dresses its abrasives through its own motions, while faithfully duplicating the required surface finish.

The savings are in time, effort and equipment required to obtain comparable results by any combination of other means. Why not have a Micromatic Field Engineer discuss with you the advantages of Microhoning in your processing plans?

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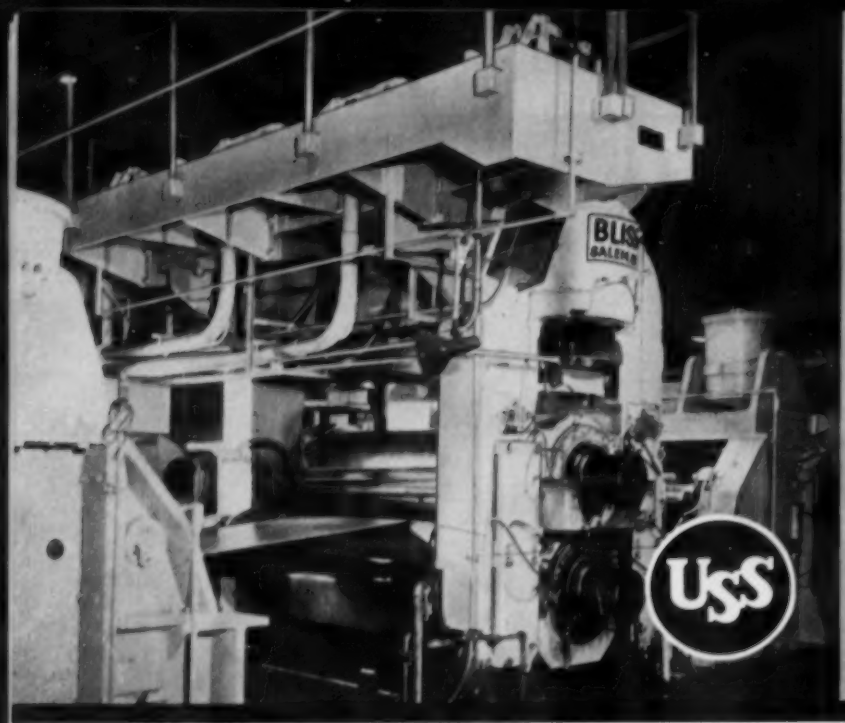

"We want a faster pickle line"

This Bliss 32" x 80" Two-High temper mill at the entry end of the Fairless Works pickle line is new and unique to the steel industry. It reduces strip slightly (2 to 3% elongation) and pulverizes skin-tight oxides. Pickling acids attack surfaces faster, speeding the entire operation and making better, more uniform pickling possible. For the Fairless Works, Bliss also designed, built and installed an automatic 19" x 53" x 48" Two-Stand tin temper mill (needs only 3 men to operate it) and another 32" x 80" Two-High mill that eliminates an extra handling operation in tempering and flattening strip prior to shearing or slitting.

When you think of ROLLING MILLS— think of BLISS!

[Here's the story of four who did]

"Versatility . . . sheet-stock now, tinplate later"

At Pittsburgh Steel, this giant Four-Stand cold mill handles widths from 20 to 60 ins., thicknesses from tinplate to 16 gage. With its heavy housings it can also be set up to roll stainless. X-ray equipment spots variations in thickness as small as .0005" to permit immediate corrections. Other electronic devices control tension, shape and finish. Automatic coil handling equipment and the latest safety devices are used throughout. Bliss also installed a Four-High temper mill and a Two-High skin pass mill at the same Allenport, Pa. plant.

"We want speed throughout... in the mill and on coil handling, too"

By rolling more than 6000 fpm, this Bliss Two-Stand tin temper mill at Jones and Laughlin is one of today's fastest. These mile-a-minute speeds, though, called for a number of Bliss-developed design precautions: dynamic balancing of all rotating parts, gear-type couplings to assure uniform angular velocities. Moreover, semi-automatic terminal and auxiliary equipment—designed for extra large coils and quick strip threading—mean longer contact time, shorter loading periods and greater tonnage all along the line. Fast, reliable, safe, this Bliss mill is capable of better quality at higher speeds with easier control.

Whatever your problem in mills and accessories—speed... versatility... accuracy... in hot or cold rolling...ferrous or non-ferrous applications—whenever you think of rolling mills, think of BLISS.

For more information about others who thought of Bliss—for rolling mills and accessories—write today for Catalog 40-A. This 60-page brochure describes Bliss mill installations, terminal and auxiliary equipment.

E. W. BLISS COMPANY, General Office: Canton, Ohio
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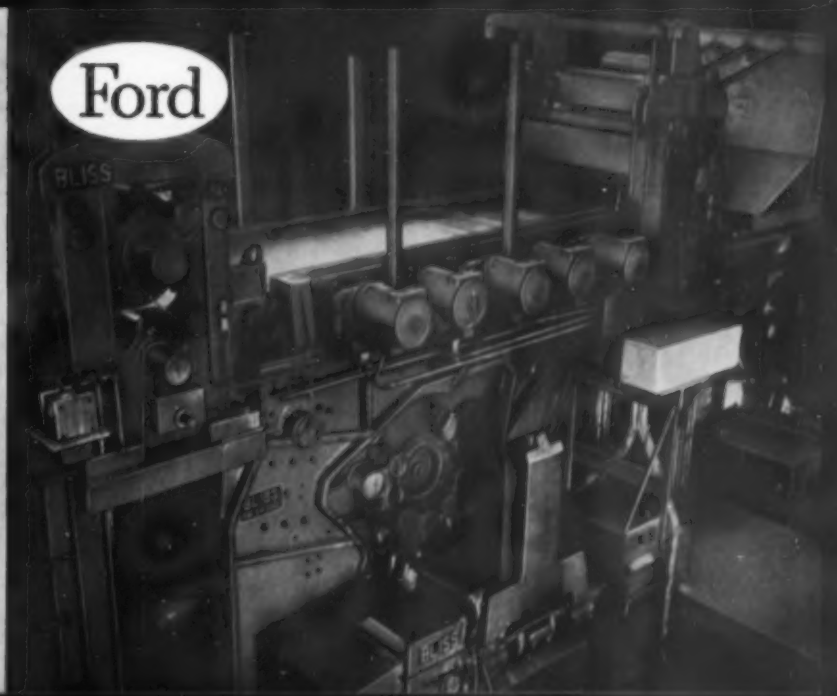
At River Rouge, this high-speed mandrel-type downcoiler by Bliss "rolls up" strip on an arbor with constant high-tension applied. Thus coils *are* tighter, more uniformly wound. Surfaces and edges are better protected, and better metallurgical characteristics are realized. After coiling, the mandrel collapses and facilitates coil stripping. Versatile, it handles a wide range of speeds, strip widths and gages. Bliss also designed and built a Four-High temper mill complete with heavy coil handling equipment for the Ford Motor Company.



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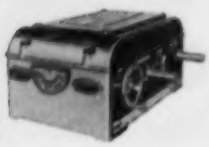

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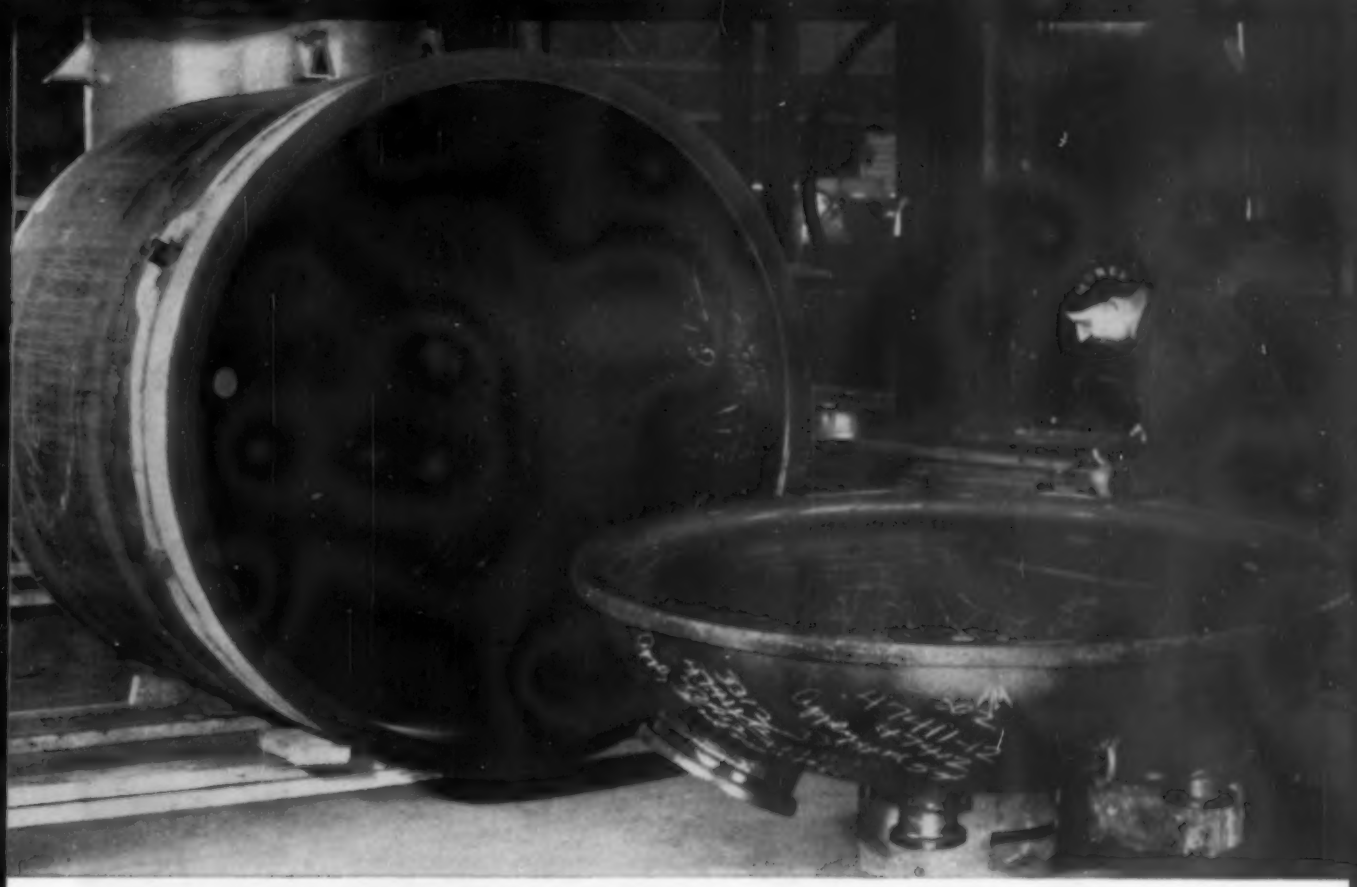


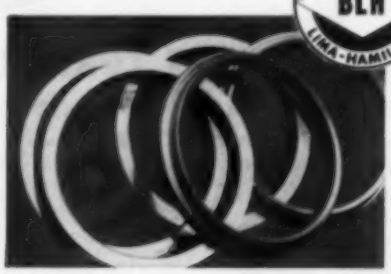
SSW forged ring flanges enable Pfaudler to increase pressure capacities of glass-lined tanks 50%

By switching to Standard Steel forged ring flanges for manholes and larger openings in their glass-lined tanks, The Pfaudler Company, Rochester, N.Y., has increased normal pressure capacities 50% above previous limits. These rolled, weldless flanges replace integral flanges formed in the tank wall or flanges formed from steel plate and welded to the tank shell.

Standard Steel forges these 24″ to 84″ ring flanges to heavier and more efficient shapes than Pfaudler could get previously. An increase in the flat surface area of the flanges permits increased pressures. The switch to forged flanges also has eliminated the serious problem of warping during annealing or stress relief before applying glass linings.

SSW shapes these rings as close as possible to finish dimensions in the rolling operation to minimize the amount of metal removed in roughing and finishing cuts. However, ample material is available for forming a bead on the edge of the flange to retain the clamps which hold the covers tightly on the gaskets.

Pfaudler's use of Standard Steel's weldless flanges is just one of the very diverse ways ingenious users are improving their products by switching to roll forged rings and flanges (12″ to 144″ O.D.). It'll pay you, too, to investigate how they can benefit you. For more facts please write to Department 8646, Standard Steel Works Division, Baldwin-Lima-Hamilton Corporation, Burnham, Pennsylvania.



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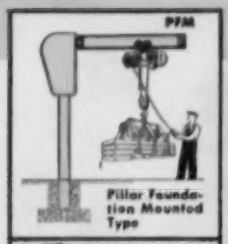

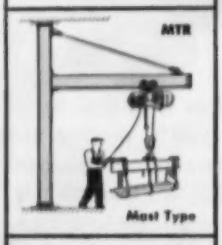

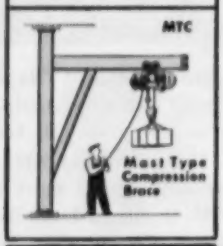

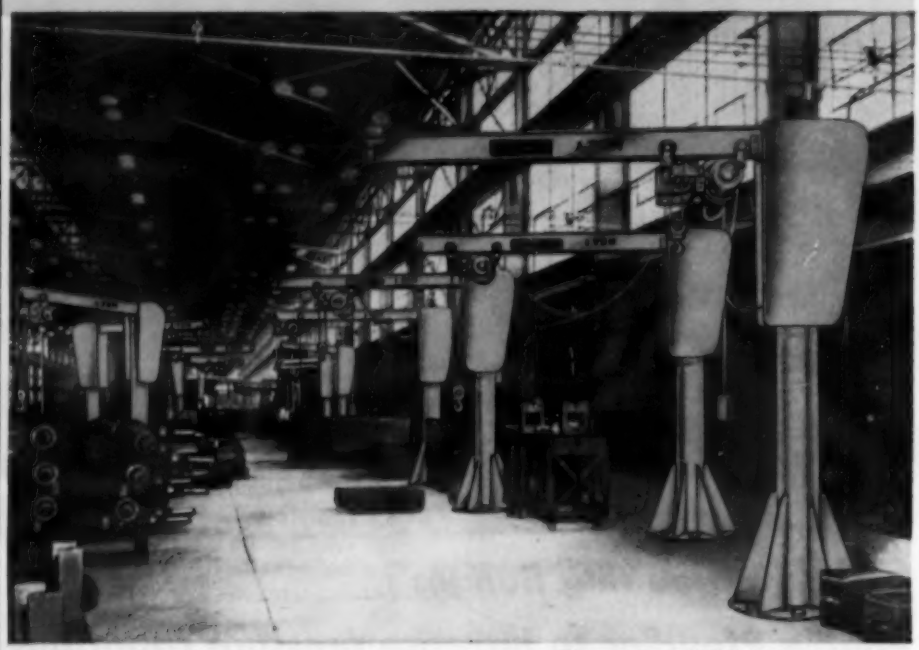

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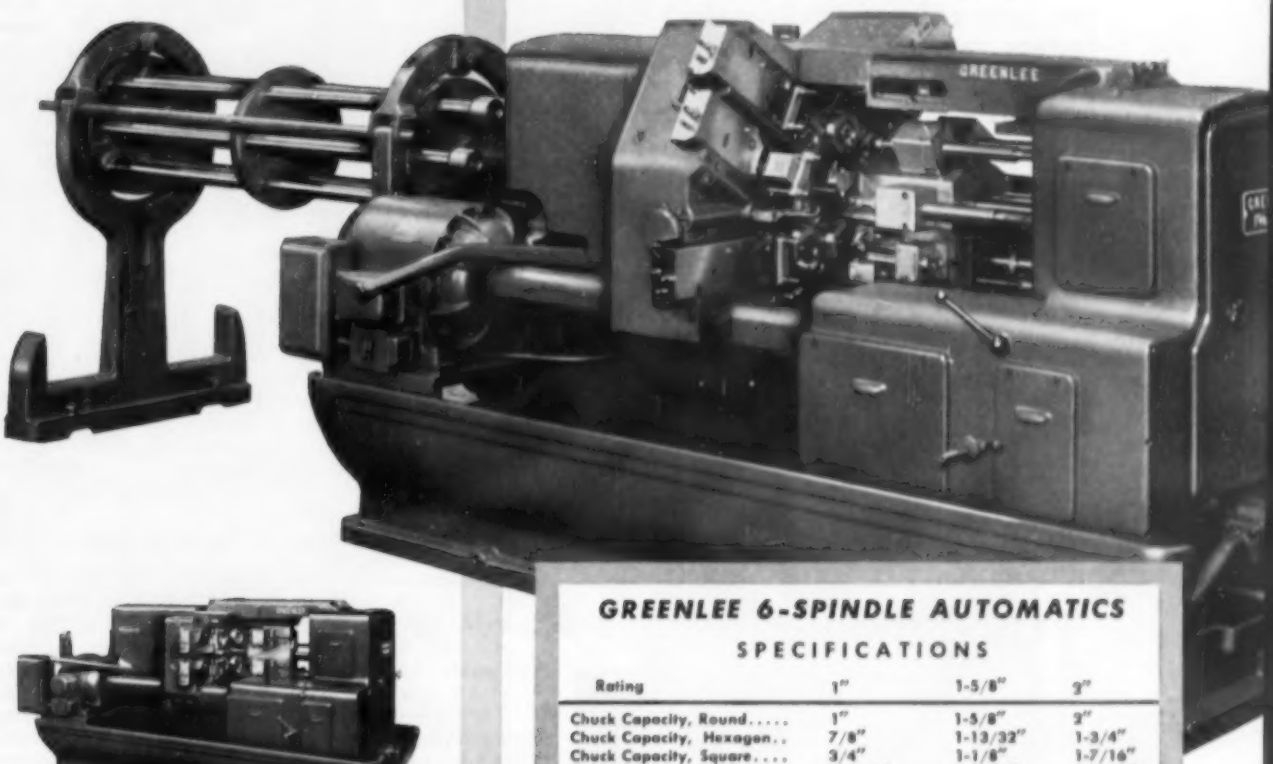

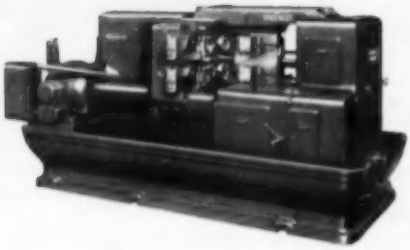

GREENLEE 6-SPINDLE AUTOMATICS
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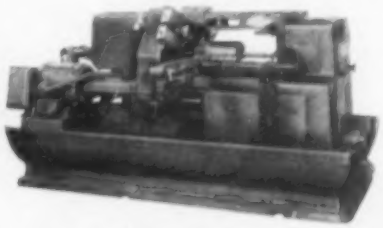
Rating	1"	1-5/8"	2"
Chuck Capacity, Round	1"	1-5/8"	2"
Chuck Capacity, Hexagon	7/8"	1-13/32"	1-3/4"
Chuck Capacity, Square	3/4"	1-1/8"	1-7/16"
Stock Feed	6-3/16"	8-5/16"	8-5/16"
Turning Length	6"	7-1/2"	7-1/2"
Spindle Speed Range	225 to 2500	105 to 2175	95 to 1935
Feed Range per Spindle Rev.	.0014 to .0218	.0017 to .0388	.0019 to .043
Motor Horsepower	15	20	25
R. P. M.	1800	1800	1800
Floor space:			
Length with Stock Reel	17'-6"	17'-3"	17'-3"
Width	5'-0"	5'-4"	5'-4"
Height	4'-11"	5'-4"	5'-4"
Net Weight in Pounds	14,400	17,940	18,150

GREENLEE 4-SPINDLE AUTOMATIC
SPECIFICATIONS

Rating	2-5/8"
Chuck Capacity, Round	2-5/8"
Chuck Capacity, Hexagon	2-1/4"
Chuck Capacity, Square	1-7/8"
Stock Feed	8-3/16"
Turning Length	7-1/2"
Spindle Speed Range	120 to 1200
Feed Range per Spindle Rev.	.002 to .0458
Motor Horse Power	20
R. P. M. of Motor	1800
Floor Space:	
Length with Stock Reel	17'-3"
Width	5'-4"
Height	5'-0"
Net Weight in Pounds	17,000

GREENLEE 2ND OPERATION AUTOMATIC



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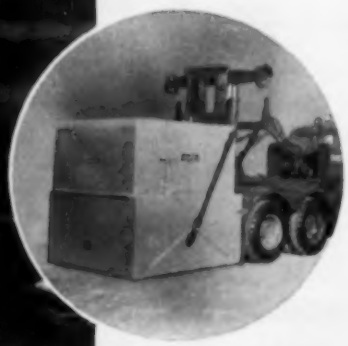
The new Dempster-Dumpster Type DTLF offers several desirable features along with all the economies provided by the Type LFW. These features include: (1) Improved load distribution with container carried in more forward position between wheel centers. (2) Extreme high dumping in cases where it is desired. (3) Vertical pick up of loaded container. (4) Container, loaded or empty, is always in horizontal plane in carrying position. Automatic locking device for positive rigidness of container while in carrying position is, of course, provided.

TREMENDOUS SAVINGS WITH THE DEMPSTER-DUMPSTER SYSTEM HAVE BEEN PROVED BEYOND QUESTION.

One truck-mounted Dempster-Dumpster, operated by only one man, the driver, serves scores of containers of various capacities up to three times greater than the average dump truck. You eliminate trucks standing idle . . . eliminate re-handling of materials . . . eliminate loading crews. You increase efficiency, sanitation and good plant-keeping.

Containers range from 2 to 21 cu. yds. capacity for use with recommended type Dempster-Dumpsters. Each container is designed to suit the materials to be handled—be they trash, rubbish, liquids, dust, bulky, light or heavy. Many leading plants, in almost every type of industry, have found it indispensable after installation. Its proved savings alone justifies an investigation of its potential value in your plant now. Write to us today for complete information. Manufactured and sold exclusively by Dempster Brothers, Inc.

The photo at left illustrates the amazing ability of the Type DTLF Dempster-Dumpster for high dumping. The three photos below show the Pick Up, Haul and Dumping action, hydraulically controlled from cab.



DEMPSTER

STEEL

Photo above shows the new Dempster-Dumpster Type DTLF dumping 8 cu. yds. of rubbish. At right you see the Type LFW with load in carrying position. Dempster-Dumpsters are available in capacities capable of handling up to 38,000 pound payloads.

One Truck-Mounted
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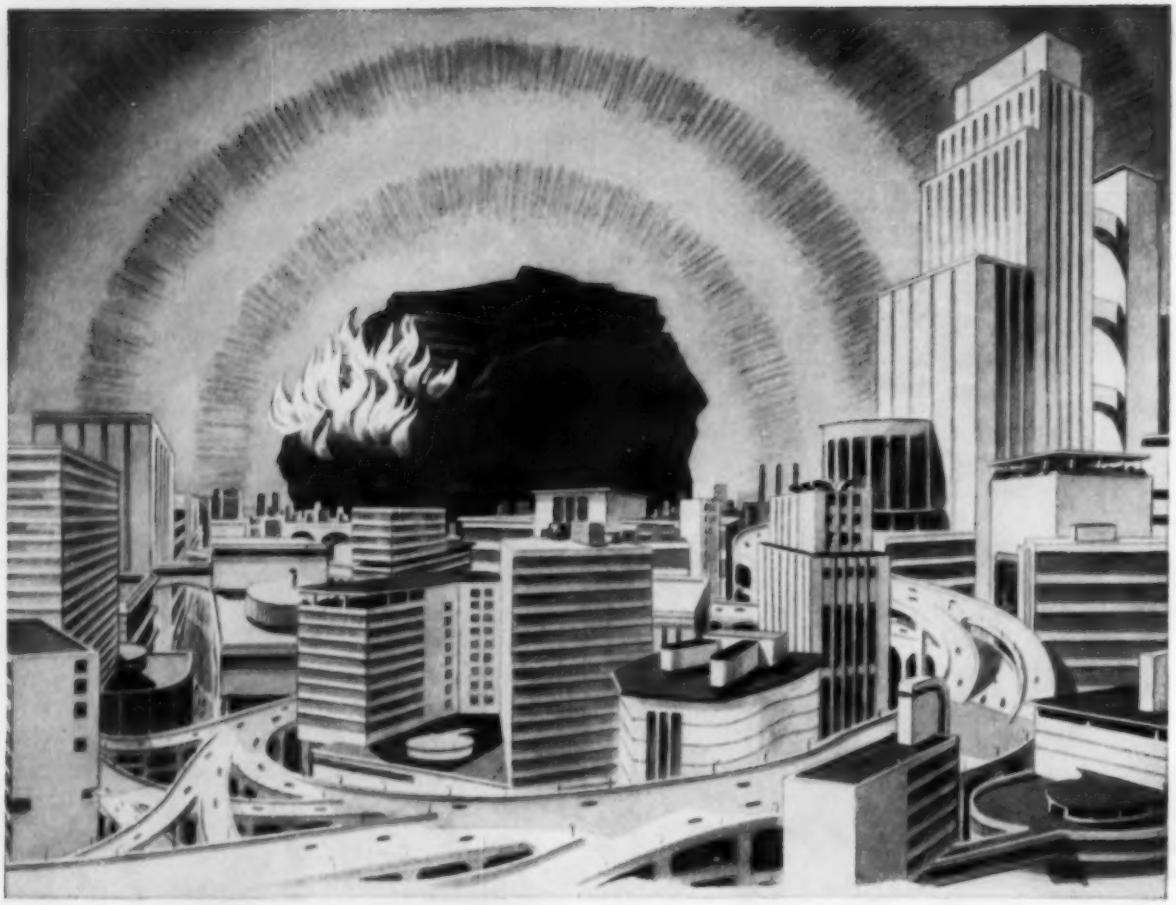

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OF MEETINGS

February 14-16, American Management Association: Personnel conference, Palmer House, Chicago. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

February 16, American Society of Mechanical Engineers: The engineer and the world of communications, Engineering Societies Bldg., New York 18. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

February 17-18, Drop Forging Association: Winter meeting, Statler hotel, New York. Association address: 605 Hanna Bldg., Cleveland 15. Secretary: R. M. Seabury.

February 18, Eastern States Blast Furnace & Coke Oven Association: Annual winter meeting, Hotel William Penn, Pittsburgh. Association address: Koppers Bldg., Pittsburgh 19. Secretary-treasurer: H. W. Fricke.

February 28-March 1, American Supply & Machinery Manufacturers' Association Inc.: Regional meeting, Warwick hotel, Philadelphia. Information: Hunter-Thomas Associates, 2130 Keith Bldg., Cleveland 15.

February 28-March 2, American Management Association: Special conference on electronics, Hotel Statler, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

February 28-March 4, Pittsburgh Conference on Analytical Chemistry & Applied Spectroscopy: Hotel William Penn, Pittsburgh. Information: L. D. Frederickson Jr., Aluminum Research Laboratories, P. O. Box 772, New Kensington, Pa.

March 1-3, American Society of Mechanical Engineers: International congress on air pollution, Hotel Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

March 1-3, Society of Automotive Engineers Inc.: Passenger car, body and materials meeting, Sheraton-Cadillac hotel, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 7-11, National Association of Corrosion Engineers: Annual meeting and exhibit, Palmer House, Chicago. Association address: 1061 M & M Bldg., Houston 2. Secretary: A. B. Campbell.

March 8-10, Instrument Society of America, Pittsburgh Section: Instrumentation in the iron and steel industry, Hotel William Penn, Pittsburgh. Information: A. F. Robbins, combustion engineer, Crucible Steel Co., Midland, Pa.

March 10-11, Porcelain Enamel Institute: Pacific coast conference, Biltmore hotel, Los Angeles. Institute address: 1346 Connecticut Ave., N.W., Washington. Secretary: John C. Oliver.

March 13-18, National Electrical Manufacturers Association: Winter meeting, Edgewater Beach hotel, Chicago. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

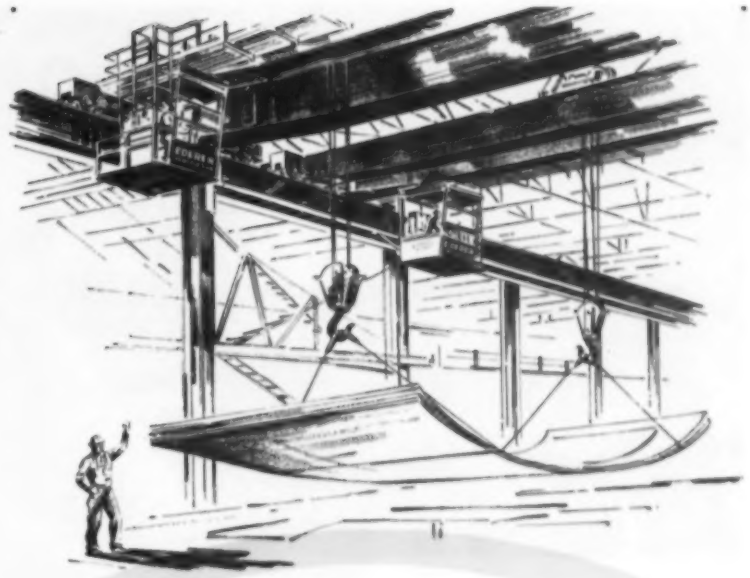
March 14-16, Society of Automotive Engineers Inc.: Production meeting and forum, Netherland Plaza hotel, Cincinnati. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 14-18, American Society of Tool Engineers: Western industrial exposition, Ambassador hotel and Shrine Auditorium, Los Angeles. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

March 15-16, Steel Founders' Society of America: Annual meeting, Drake hotel, Chicago. Society address: 920 Midland Bldg., Cleveland 15. Secretary: George K. Dreher.

March 15-17, American Institute of Electrical Engineers: National conference on electrical utilization of aluminum, William Penn hotel, Pittsburgh. Institute address: 33 W. 39th St., New York 18. Secretary: N. S. Hibshman.

March 16-18, Pressed Metal Institute: Annual meeting and exhibit, Carter hotel, Cleveland. Institute address: 2860 E. 130th St., Cleveland. Managing director: Orrin B. Werntz.



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EDERER has "job-engineered" cranes to the specific requirements of a plant where the work required two cranes with speeds synchronized for "tandem" operation in handling extra heavy loads. Full dynamic controls with adjustable voltage control allow intermediate speeds from 0 to full load speed to be adjusted at any time to suit any operating requirement.

This is only one of the many ways in which EDERER engineers and builds cranes to do any type of work in any industry. Similarly, EDERER can "job-engineer" a crane to the specific requirements of YOUR plant. Our industrial crane catalog can give you more details . . .

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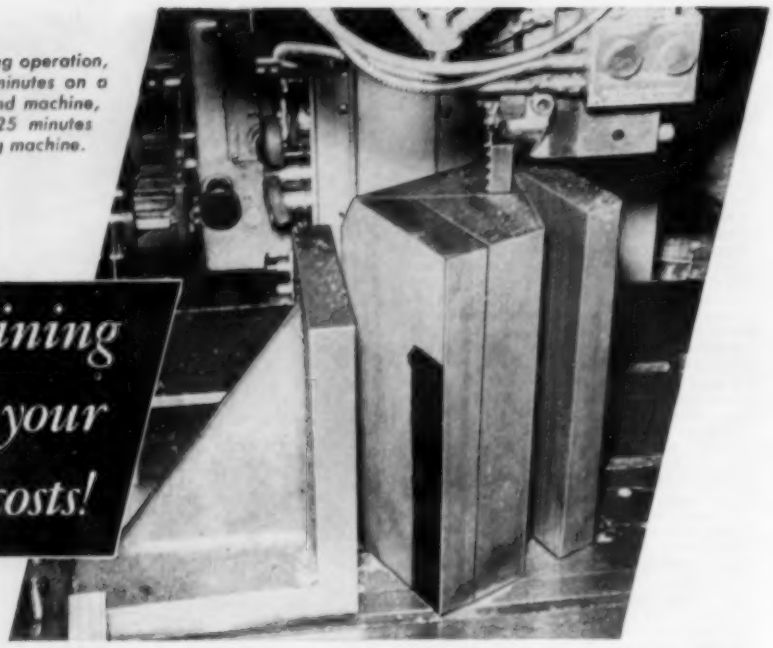
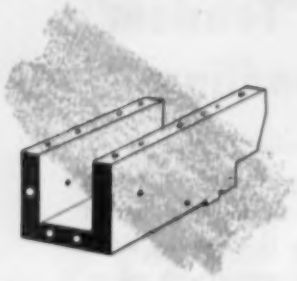
• *This slotting operation, performed in 72 minutes on a DoALL band machine, formerly took 325 minutes on a milling machine.*



A new machining concept to cut your production costs!



TIME SAVING: 7 hours, 3 minutes. Total band machining time on this part (slotting and cutting the end) is 3 hours, 12 minutes. Performing the same operations on a milling machine took 10 hours, 25 minutes.

How would your plant machine 100 duplicates of the part illustrated above? You are seeing it being made on a power feed DoALL band machine at about ⅓ the cost of milling, the previous method used.

Production band machining has come of age, with new *high speed steel* blades that last for more than 3000 square inches of cutting and cut up to five times faster than previous blades. The work is positioned on the hydraulically powered table and automatically fed into the continuous-cutting saw band. A built-in coolant system permits high cutting rates. Variable speeds and feeds and a wide range of different blades provide optimum production and finish. Machine tool accuracy is obtained.

Once you see it, you realize that band machining is the *obvious* way to do this and thousands of other production machining jobs. But, to get the savings this new concept offers, you have to look for the jobs in your shop that band machining can do faster and cheaper. A DoALL man will help you find them. He'll bring a machine to your plant and demonstrate its advantages, free of charge. Write or call. *The DoALL Company, DesPlaines, Ill.*

NEW COLOR FILM — "Production Band Machining" now available showing operation of new machining concept.

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How temperamental can a piece of steel be?

● Plenty! Because steel is one of the most *versatile* of all materials, it can play tricks on you . . . can be mighty temperamental, even obstinate. But, properly controlled, it works for you precisely the way you want it to!

For generations, National-Standard's Athenia Steel Division has specialized in the behavior engineering of high carbon steel for the most exacting services. Here, they've learned how to take the fullest *advantage* of steel's versatility. It results in specially engineered, rigidly controlled steels that do a *better* job in all kinds of products from umbrella ribs and pen points to camera springs and piston rings.

Perhaps defense production brings you new problems in the application or behavior of steel. National-Standard and Athenia offer you the kind of engineering and development service that has speeded production and cut costs for many and many a manufacturer.

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NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE	*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

...ON JET RINGS

By switching to flash butt-welding of extruded sections, we helped one customer cut fabricating costs of a jet engine ring from $67.85 to $41.93. A saving of $25.92 per ring — roughly 40%.

This is one of many cases in our files where rolling and flash butt-welding of bars, sections, extrusions or plate has proven to be the most economical and practical method of fabricating circular components. Shown below are some other "American Welded" components.

If you require a similar part, it is very likely that this type of fabricating can cut your costs. Why not write our Product Development Division today? They will be glad to study your problem.

THE AMERICAN WELDING & MANUFACTURING COMPANY
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WELDING • MACHINING • FABRICATING

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Rolled and flash-welded rings, machined to exact specifications and delivered ready for assembly.

WHEEL AND RIM ASSEMBLIES
Weldment of carbon steel bar and plate for use on heavy earth-moving equipment.

TURBINE FRAME ASSEMBLIES
Formed sheet metal bands and flash butt-welded rings fabricated into a jet engine component.

NOZZLE BOXES
Complicated welded assemblies of machined rings and sheet metal.

COMPRESSOR CASES
Welded band for hermetically sealed refrigerator compressor.

SPECIAL MILL ROLLED SECTIONS
Amweld can show you how to save critical material and valuable machinery time by use of these sections.

MOTOR FRAMES
Steel bars and plate formed and welded into industrial motor frames.

Send for free catalog of American Welding Production Facilities.

CIO Merger Terms

The CIO's terms for merger with AFL: No raiding campaigns by unions like Dave Beck's AFL teamsters; "industrial" rather than "craft" organizing of the chemical, metal mining, distributive and other industries; war on Communism, racketeering and racial discrimination in individual unions; and a well financed and staffed new federation that can be a "functioning" enterprise. Mr. Beck is the problem child. The CIO's first two terms are aimed directly at him.

Pension Fund Quiz Continues

The Senate Democrats will continue the investigation of welfare and pension funds in much the same spirit as the Republicans. Sen. Paul Douglas (Dem., Ill.) took over from Sen. Irving Ives (Rep., N. Y.) as chairman of the Senate Labor Subcommittee studying the matter. The transition was made with scarcely a ripple. In their report, Senator Ives and his associates found: Of 26 funds surveyed, two-thirds showed bad handling. Six were "grossly mismanaged," 13 permitted "questionable practices" and seven were "well managed." Currently, pension funds are worth some $17 billion, and employers are paying about $5 billion annually into the programs. The Ives report is an interim affair. Legislation on the matter is still a year away.

New Tack for NLRB

National Labor Relations Board has ruled that craft groups cannot obtain severance from an existing plant-wide bargaining unit to go nonunion, although they can obtain such severance to go to a different union. The decision, which involved crafts at Campbell Soup Co., is peculiar. In the past NLRB has applied the same craft severance standards whether a unionized craft sought to designate a different union or sought to drop union affiliation. Look for a legal hassle over the ruling because Taft-Hartley gives workers the right to refrain from union activity and sets up the decertification election procedure to implement that right.

More Barter in Industry?

Watch for more bartering in industry because of a provision in the internal revenue law. It states that no income tax shall be levied against a profit from an even exchange of properties of like kind held for "productive use." Commerce Clearing House points out how this works: An owner of a plant purchased for $20,000 rents it, then trades it for another rental property worth $24,000. There's no tax on the difference. Or, a salesman trades the car he uses for another worth $1200, but he puts up $500 in cash. He has already taken $300 in tax depreciation on the old car, so he actually gains $400 on the trade-in, but the gain is not taxable.

Vance Unit Will Go Slow

The new U.S. committee headed by Studebaker-Packard Corp.'s Harold Vance will go slow about using the government's borrowing authority to

expand the mobilization base. Mr. Vance and his committee members (p. 40) believe that if we have a war it will be a short one.

$1 Billion More for Maintenance

The nation's maintenance expenditures will increase by $1 billion in 1955. General Electric Co.'s Howard F. McCullough says the outlay will be about 9 per cent higher than last year's. The increase will be caused by greater use of automation.

American Standards: 1440 O.K.'d

U.S. business now uses 1440 standards, says American Standards Association. Sixty-four new standards and 88 revisions were approved in 1954. The greatest number was in the electrical field. Last year was the first time standards were approved for office equipment. One of the most outstanding approved last year, says ASA, was for transformers. It will save an estimated $100 million in the next three years.

Farmers Wise Mechanize

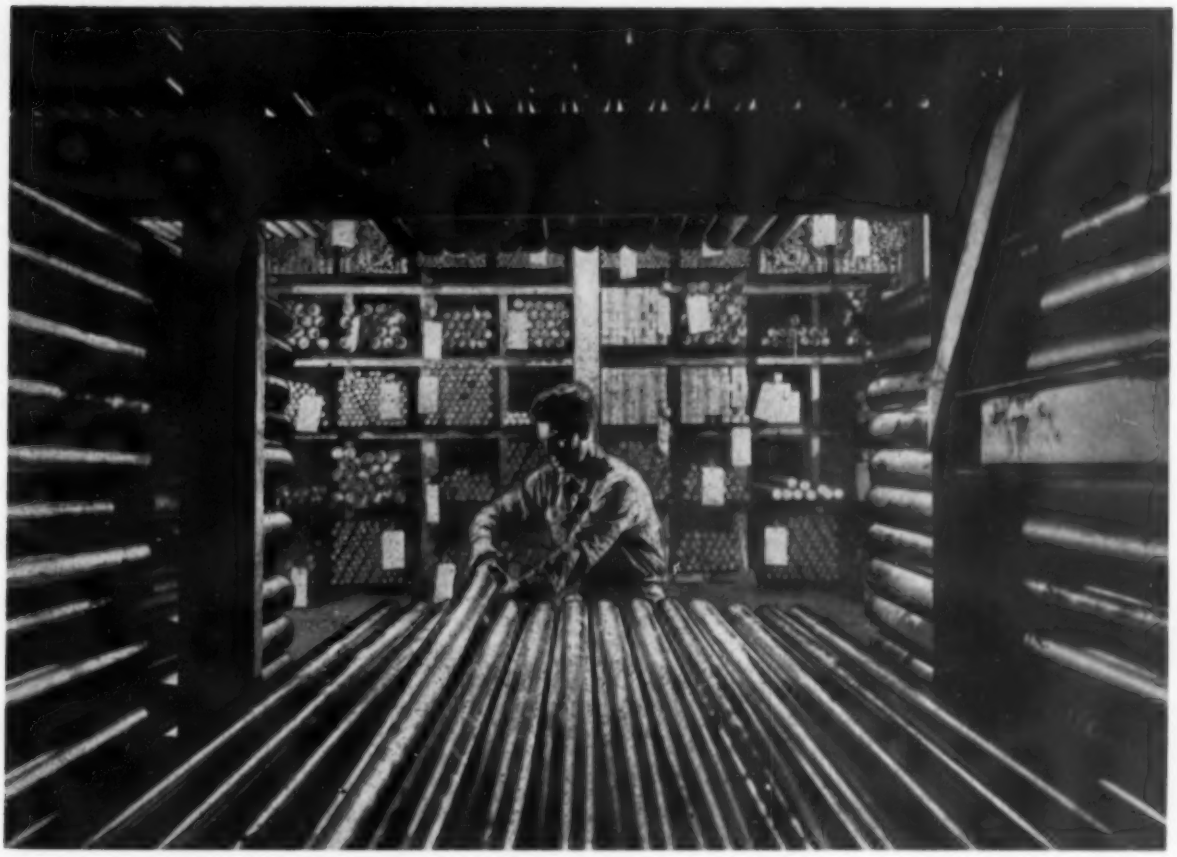
You can expect more farm mechanization. Farm families are using 500 per cent more electric power than they did in 1940. Electrical applications in agriculture now number 200 or more. To feed the expected national population of 210 million in 1975 farmers will need 100 million new acres of crop land or their equivalent in greater productivity of existing acreage. Since experts believe that only about 30 million additional acres of land can be cultivated through reclamation and irrigation in the coming 20 years, the answer to the problem lies in greater productivity. And that means more mechanization.

Straws in the Wind

The White House will not ask Congress for standby economic controls for use in emergency . . . A cabinet-level committee recommended revamping the government transportation policy to give the railroads greater freedom to set their own freight rates and to reduce federal aid to air, shipping and trucking industries . . . India has accepted a Russian offer to build a 1-million-ton steel mill in Nehru-land . . . Insurgent stockholders are taking their battle for control of A. M. Byers Co. to court after losing their bid to oust present management.

This Week in Metalworking

Metalworking will enjoy record or near-record production for 1955's first five months, then slow down in June, auto strike or no strike (p. 33) . . . Curtiss-Wright Corp. is diversifying into more nonaircraft lines (p. 36) . . . Thirty Los Angeles firms are co-operating in a joint product development and marketing program (p. 37) . . . Metalworking earnings in 1954 held up well despite a general sales decline (p. 39) . . . Watch out for out-of-state tax traps (p. 44) . . . Makers of wheels are rolling toward higher sales this year (p. 45).



Aimed right at your alloy needs

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Thousands of tons of certified alloy steel in 1698 different sizes, shapes, analyses and conditions await your call at Ryerson. New leaded alloys are on hand in three different carbon ranges. Standard analysis steels are supplemented by a wide range of aircraft quality alloys. No matter what your alloy requirement, you can depend on Ryerson for quick delivery of highest quality steel.

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No order is too large to fill from stock, no order too small for quick personal service—so, next time you need alloy steel call your nearby Ryerson plant.

PRINCIPAL PRODUCTS

CARBON STEEL BARS — Hot rolled & cold finished.

ALLOYS—Hot rolled, cold finished, heat treated.

STAINLESS—Alleghany bars, plates, sheets, tubes, etc.

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What is QUALITY in steel?

Here's one way you can look at it

You sometimes run into much loose talk about QUALITY in steel. From it you might gather that QUALITY is some highfalutin mark of distinction which divides steels into high or low classes—like a caste system!

There is no such thing.

One steel is as good as another. Everything depends on the *fitness* of a particular steel to make the job for which it was ordered—efficiently and economically. THAT'S THE TEST FOR QUALITY.

FOR EXAMPLE—Is Cold Rolled higher in "quality" than Hot Rolled? Is Stainless superior to Carbon Steel? APPLY THE TEST!

You might say that QUALITY in steel is a *particular combination* of gauge and/or size, workability and finish that best meets the mechanical and economic requirements of a *particular job* at a *particular time*.

Why a particular time? Because circumstances might make it necessary for you to relax your "ideal" specifications to keep a job running.

And this meaning of QUALITY holds true whether it's made-to-order mill steel or picked-to-order warehouse steel that you may be buying.

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When you buy mill steel
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Hot Rolled and Cold Rolled Sheets
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High Carbon Specialty Wire
Aluminum Cable Strand Reinforcement
Rope Wire Tire Bead Wire Welded Fabric
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Cold Rolled Carbon Spring Steel

When you buy warehouse steel
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COLD ROLLED STRIP — Coils Cut Lengths All Tempers
SHEETS — Cold Rolled Hot Rolled Pickled
Galvanized Long Terne

Standard or Production Sizes
Sheared or Slit to Actual Working Dimensions

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Men Who Tell

Forty-two pages to the right you will find the first in this magazine's 1955 Program for Management series. It is called Product Communication. Some of our editors wanted to call it Product Promotion. Industry men may lump all the activities described as Advertising. We chose the broader, if less familiar title, because the article covers all the means by which industry tells its public about what it makes.

Product communication is a lusty service. More than eight billion dollars was spent last year for time and space advertising, direct mail catalogs, public relations, industrial motion pictures, trade shows and exhibits, labeling and trademarking. That is equal to the factory price of all the new passenger automobiles produced in 1954. It is more than four times the annual expenditures for product communication fifteen years ago.

As product communication has grown in size, so have the men in advertising, public relations and other phases of promotion grown in stature. As the service has become recognized as a great economic influence and as its functions have become better understood by top management, so have the men who plan and execute the campaigns become recognized as important executives in business and their function in the economy better understood.

Within companies, the public relations directors, the advertising managers and the other people concerned with product communication—whatever their titles— are gaining acceptance in management. Many companies are creating new executive positions, under such titles as marketing managers, to co-ordinate all product promotion activities.

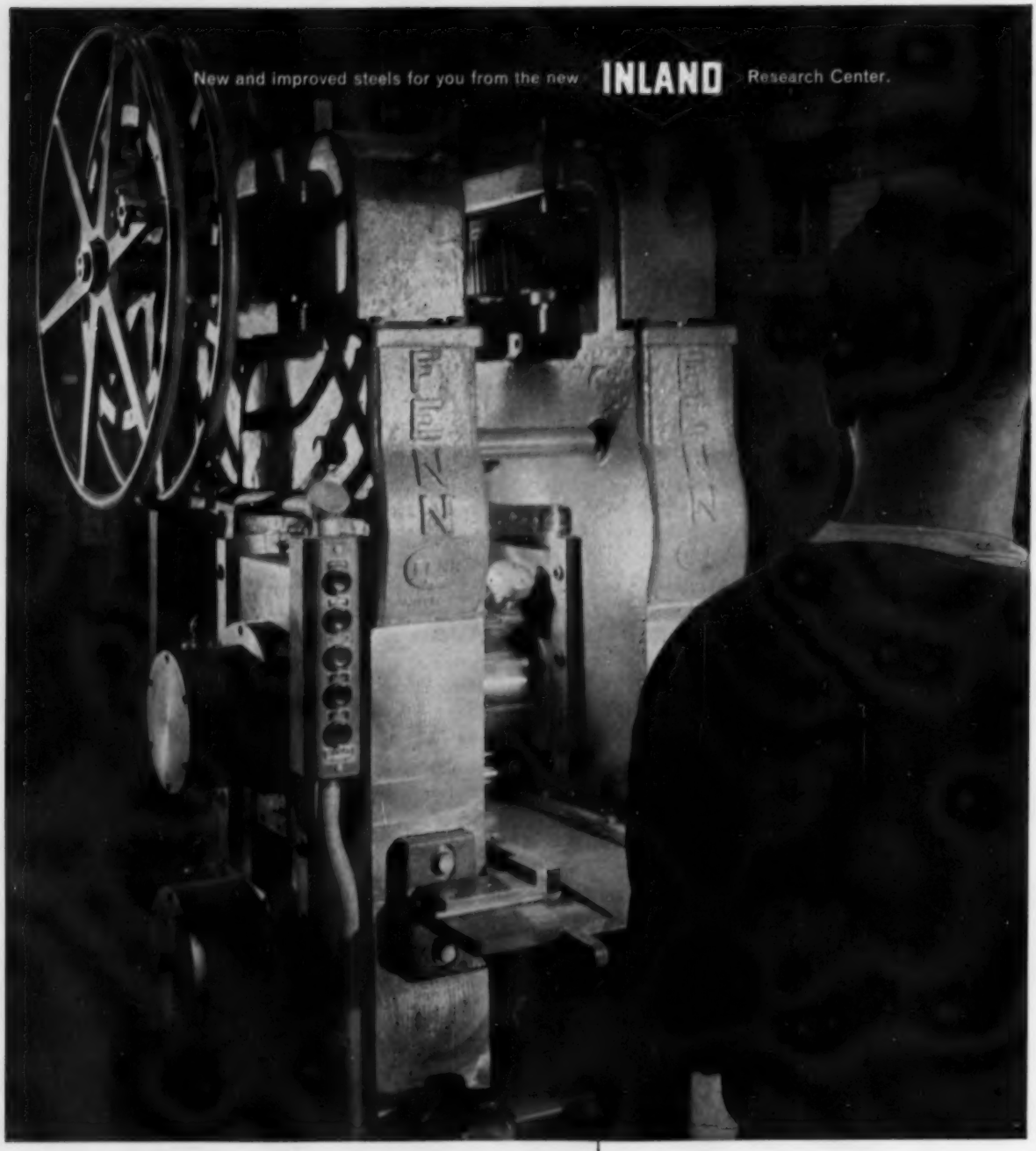
From the outside, companies doing a good job of product communication are seeking the advice and taking into their confidence the specialists: Advertising agencies (Standard Advertising Register lists 2564); market research authorities (American Marketing Association lists 275 member firms offering marketing research and consulting services); public relations agencies; designers of show exhibits; and producers of industrial motion pictures.

Together, they represent a powerful economic force that speeds the flow of products after they leave the factory, a function just as important as anything that happens within the manufacturing plant.

They are the men who tell the world about what you make.

Walter J. Campbell

MANAGING EDITOR



THIS PINT-SIZE ROLLING MILL MAY SAVE YOU KING-SIZE HEADACHES (AND MONEY TOO!)

At Inland, "new ideas" are considered as vital a raw material in steelmaking as top grade iron ore and coal. Establishing reserves of this basic ingredient is a continuing job for Inland's research and development people. The new Inland Research Center in Hammond, Indiana, where Inland researchers look for better steels and more efficient ways to make them, is the most recent addition to Inland's "new idea" resources.

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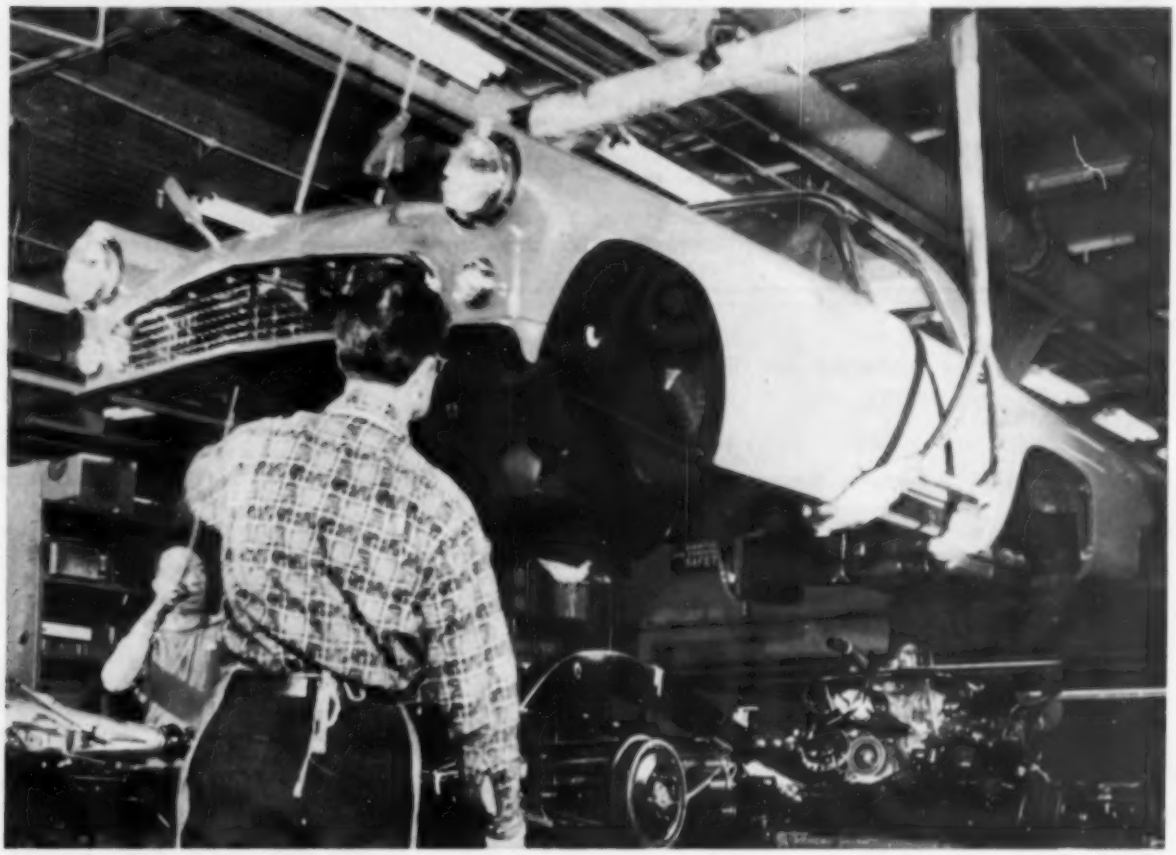


Ford Motor Co.

As autos run, so runs the economy. That's why . . .

Metalworking To Sprint 'til June

PATTERN for profit: That's the picture of second-quarter and first-half production prospects STEEL finds in 12 bellwether metalworking industries.

A check of the dozen industries (see pp. 34-35) reveals that the current high output levels will hold through May, but there will be a general dip in June, auto strike or not. If there is a walkout, the effect will be a fairly sharp slip in June. If not, there will still be a moderate decline because the strike possibilities are being allowed for now in high assemblies by the auto firms.

Factors—But motordom's labor situation isn't the only—or even the most important—buttress for the economy over the next few months. Formosan difficulties and the change of leadership in Russia are beginning to put a sharper edge on consumers' already sharp appetite for goods.

Hotpoint Inc., for example, is enjoying first quarter appliance sales that are 9.2 per cent above those of the same quarter last year. Conlon-Moore Corp.'s appliance business is 15 per cent ahead of last year's, and it expects its second-quarter performance to exceed last year's by 10 to 12 per cent. Speed Queen Corp. expects its appliance sales in the first half to surpass last year's first half by 5 or 10 per cent.

More Houses—The need for new houses still astounds economists. Three months ago predictions for housing starts in 1955 ranged from 1 million to 1.2 million. Now they're 1,250,000 to 1.4 million. That's because of unexpectedly high starts in the first six weeks of the year and prospects for a record second quarter. Nearly all phases of construction are booming, and a peak volume of nearly $40 billion this year is in the cards.

The all-time high demand in the first quarter for some 2 million new cars (see p. 51 for details) has put the extra zip in the economy that should last for the first five months of the year, then simmer down in June even if there's labor peace. As an example of how many other industries depend

HOW METALWORKING IS DOING

	First Quarter	Second Quarter
AUTOMOBILES	Near record output of cars is close to 1953 peak rate.	January-February-March output will continue in April-May, but June will be off, strike or not.
APPLIANCES	Production up 10-15 per cent ahead of last year's.	Performance off a little from first quarter, but still up 10 per cent from year ago.
CONSTRUCTION	Above the year ago level, already off and running.	You ain't seen nuthin' yet, especially in housing.
SCREW MACHINE PARTS	On par with first and fourth quarters last year, but no records will be set.	April will be on par with first three months. So will May if auto peace chances improve. June will slip, strike or not.
STAMPINGS	Above fourth quarter, 1954. Appliances, construction and autos are the mainstays.	Upturn will continue if no auto strike. If walkout, May-June will slip.
FASTENERS	Exceptionally numerous new orders arrived in December to make an excellent January-February-March.	As autos go, so go fasteners.

on autos: Some 60 per cent of drop forgings go directly or indirectly to cars. About 20 to 25 per cent of all fasteners go directly into automobiles.

Tie in—So, those makers of components that are used heavily by Detroit have more than academic concern about the labor situation. Their consensus: No strike, or at worst, a short one.

Significantly, makers of components, such as electric motors and steel castings, are more optimistic about prospects after the end of May. Their products aren't so closely tied to automobiles as stampings, screw machine parts or gray iron castings.

Metal Supplies — No serious shortages in any steel products will trip metalworking's five-month sprint. But spot scarcities of aluminum and copper are causing and will cause a little trouble. A growing danger of war may eventually spur scare buying of the metals, but it hasn't yet.

Steel buying by the automakers in May and June will be for delivery in June and July and for production in August and September. The August-September assemblies of automobiles are expected to be quite low, nothing near what they will be in the first half of the year. So, production of flat-rolled sheets in May and June will suffer because of the third-quarter dip in auto production, strike or no strike.

In semifinished there's a pickup currently in European imports of slabs and billets. That should continue through the second quarter and bolster American production all that period.

Aluminum—There's not enough aluminum at the moment. Independent foundries and extruders are especially hungry for the metal, much of which is still going into government stockpile. Wrought products are continuing the high levels of production reached in November and December. The forward momentum is continuing in all aluminum fabricated products. Both first and second quarter may set successive records.

One reason why aluminum is tight now is that in 1954, when there was scrap to spare, export licenses were issued promiscuously and much of the metal went abroad

where demand was—and is—high. By the time our own upturn came last fall, the supply was pretty well shot, creating shortages that still exist. The cutback in the military set asides will have little effect because the extra amount available to civilian producers will be negligible. Total aluminum earmarked for the military and atomic energy next quarter is 135 million lb, 5 million less than in January, February and March.

Parallel in Copper — Shortages also exist in copper. Washington's tightening on export licenses last week (see p. 126) should relieve, although not solve, that problem. Coppermen also want the government to release metal destined for stockpile, but their chances for that are poor.

A check of commercial processing shops turns up much the same optimism for the first half, except among job platers. One plating company says: "Our sales this quarter will be only 50 per cent of what they were in the same months of 1954. The second period looks no better." But C. E. Herington of Metal Treating Institute checked 17 heat treaters and found that 16 of them thought that 1955 will be a better year for them than 1954. Order backlogs for ten are running at about the same level as late last year. Seven had more orders on the books.

One sure-fire indicator of business activity is electric power generation. In the week ended Jan 29, it exceeded 10 billion kwhr for the first time in U.S. history. New records will probably be set frequently from now through May. Power consumption this quarter is running about 7 per cent ahead of last October, November and December's. Ten billion kwhr can't be wrong.

Construction '55: New Gains

Total volume of construction may hit $56 billion in 1955—$40 billion for new construction, $16 billion for maintenance and repair. John MacLeod, president, the Associated General Contractors of America says that in a few years the total construction volume will reach $60 to $75 billion per year.

HOW METALWORKING IS DOING

	First Quarter	Second Quarter
DROP FORGINGS	Better than fourth quarter, a slow but steady pickup.	Improvement will continue and period will be 5 per cent above year ago's unless there's strike in autos.
CASTINGS	Good quarter, especially for nonferrous, steel castings. Foundry business generally up.	On par with first period. Auto strike would hurt, but not so much as for fasteners, screw parts, stampings.
MOTORS	Slightly better than October-November-December, 1954.	The gains will hold. Auto strike will have little or no effect.
STEEL	The ingot rate of around 85 per cent will hold through March.	March's pace will continue in April-May, but June will dip, even if there's no auto strike. Quarter's average: About 80 per cent.
ALUMINUM	Peak output limited only by basic capacity. Rolling time will be open only because there's not enough metal.	Same story as in the first quarter.
COPPER	Same story as in aluminum. Primary producers are going full tilt. Fabricators could use even more.	More primary will come, so these three months should be better than the first three.

Curtiss-Wright's ultrasonic drill, other products help . . .

Aircraft Builder To Diversify

CURTISS-WRIGHT CORP.'s diversification efforts into non-aircraft fields showed up in a Science & Industry Exhibit in New York early this month.

The show marks C-W's entry into the fields of ultrasonics, laboratory electronic devices, nuclear equipment, industrial television and special plastics. Also on display were other equipment items, such as precision spring clutches, heavy-duty pumps and diesel engine governors.

In the Spotlight—But the stars of the show were six new products in the electronics field and ten applications of ultrasonics in quality control, manufacturing and research and food processing.

A noncontact nuclear gage measuring the thickness of a continuous running strip of material actuates a visible or audible warning when predetermined limits are exceeded. This gage has applications in the metal, paper, plastics, rubber and textile industries.

Quick Heat—The company's dielectric heater provides instantaneous heat through a mass at controlled temperatures permitting fast laminating, preheating and laboratory operations requiring high temperatures.

Other electronic products include the Spectrapolarid, which makes possible accurate duplication of colors; lightweight detectors that operate on a flashlight battery; infrared viewers that make visible objects 12,000 ft away; and a compact unit to count pulses and measures instantaneous value or pulse frequency rate change.

Speedy Sound—In the field of ultrasonics, Curtiss-Wright's Diatron, an ultrasonic drill, cuts intricate shaped holes in metals and ceramics in a single operation; a "seeing eye" Sonometer locates defects in materials and has been successfully tested on thin foil, sheet 30 in. thick and odd-shaped parts; an impulse-echo principle instrument, with a single head serving as sender and receiver, will detect flaws, measure thickness and compute fluid content.

Curtiss-Wright also displayed equipment for ultrasonic cleaning and degreasing and a compact, closed-circuit industry television system. The C-W system comes equipped with a low-cost picture tube and utilizes 35 mm camera lenses.

McKee Shoots for New Markets

Arthur G. McKee & Co., designers and builders of steel plants and petroleum refineries, are setting their sights on diversifying to construct facilities for the chemical and nonferrous metals industries.

H. R. Moorhouse, secretary-treasurer, also believes that large expansions are ahead for McKee's regular customers. "Large sums," he remarked, "have already been assigned to the development, production and preparation of taconite for use in blast furnaces. Much greater investment is yet to come."

The company has a contract to design and engineer beneficiation equipment for Reserve Mining Co.'s plant at Silver Bay, Minn.

AMF Plans Nuclear Reactor

American Machine & Foundry Co. have completed plans for building the first nuclear reactor to be owned and operated by private industry. The reactor and its supporting laboratory facilities will cost between $1 million and $1.5 million and will be used for research in the industrial and humanitarian fields.

AMF is asking other companies to participate in the program.

Thirty small-to-medium companies are proving . . .

Co-operative Research Pays Off

IN THE SPIRIT of the old West, a number of small-to-medium manufacturers in Los Angeles have joined forces to do a job they couldn't handle separately. Joint product and market development is their modern version of pioneering.

Within the framework of Industrial Mfg. Services Corp., 30 medium-size Los Angeles firms in non-overlapping industrial categories uncover sales leads, develop products and interchange counsel and contacts.

Initial Notch—Among the first benefits of the group is a metal packaging clip, called Pak-Lok, for coupling cans in clusters of 4, 6, 8 or 12. The metal clips allow ready recognition of the manufacturers' products.

At the annual output of 1954 of 6.7 billion cans, including 1-million 6-can packs, brewers could have saved at least $15 million on their packaging costs by replacing paper cartons with the metal clips, says IMSCO. Other potential users include canned fruit and vegetable merchandisers. Coupling the commonly used canned items in unit packs could greatly increase tie-in sales.

Big Chief—Under President Harvey Stowers, former associate of DeWitt C. Ramsey, president of Aircraft Industries Association, IMSCO carries on its research and development through its own engineering and marketing staffs. The company also retains an advertising agency.

Member companies are carefully selected for experience, specialized know-how and reputation for ethics. These firms are in a broad range of 108 industrial classifications such as tools and dies, metal manufacturing, heat treating, brazing and plating and electronic parts and components. Total factory area of all members' plants is 500,000 sq ft, total employment 3500 and total sales volume $50 million.

Ready To Roll—Pilot manufacturing machines for the Pak-Lok metal clips are expected to be ready in three to six months. IMSCO members who will manufacture the product haven't been selected.

But the group isn't stopping with the development of these clips. A unique pushbutton weaver that will enable a housewife to make a 3 x 5-ft rug in less than two hours is nearly ready to hit the market.

Engineers Choose Pittsburgh

Five top national engineering societies are to move headquarters to Pittsburgh, subject to approval of their directors. They are: The American Society of Civil Engineers, American Institute of Mining & Metallurgical Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers and the American Institute of Chemical Engineers.

A committee of society executives recommended the move from New York on the basis that Pittsburgh offered "the lowest capital cost," and "the lowest annual expenditures." Pittsburgh civic and business groups have pledged $1.5 million to be used for a new headquarters building.

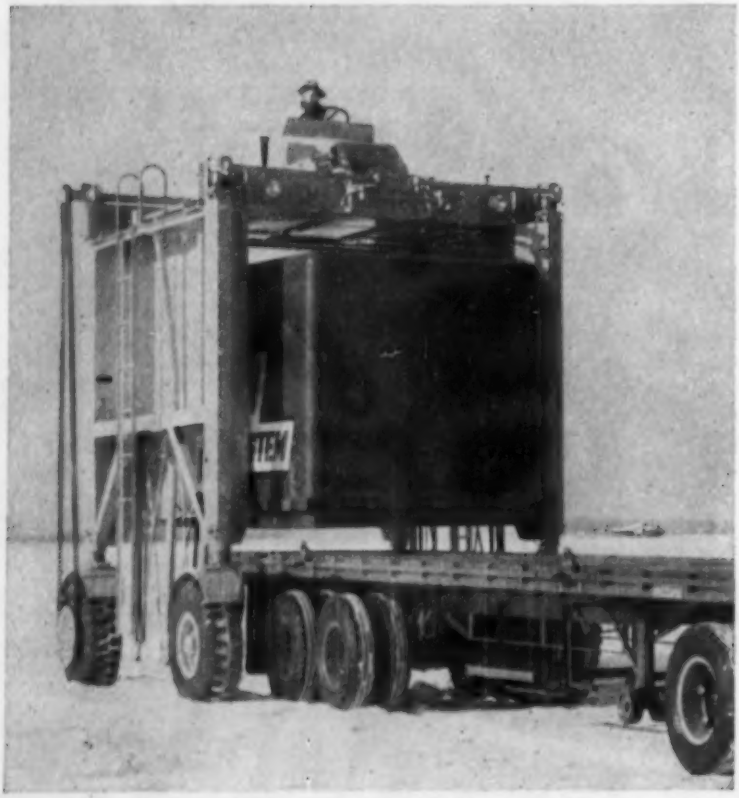
Dakota's Lure Industry

Favorable electric power rates may bring new industry to North Dakota and neighboring states. A study points out that the lignite fields underlying western North Dakota, eastern Montana and northwestern South Dakota contain about 12 per cent of the estimated recoverable fuel reserves in the United States. This would guarantee a long-time supply of low cost electric power for incoming industry.

A girl holds two six-can packs clipped with Pak-Loks, a cartoning device developed by 30 co-operating Los Angeles firms

Steel Mobilvan is placed on a flatcar by a Clark-Ross fork lift truck

Mobilvan System: Boost to Piggybacking



Ross Carrier positions first of two Clark Mobilvans on a 35-foot trailer

CLARK EQUIPMENT Co.'s bid to add momentum to the piggybacking movement is its new mobilvan system. Key feature of the system is the use of a $1500 lightweight van 17 ft long, 8 ft wide and 8 ft high and an automatic locking device enabling the van to be secured to the bed of a railroad flat car or flatbed highway truck.

Another factor emphasized by Clark officials is that the 20,000-lb capacity vans can also serve as mobile warehouses, indoors or out.

How It's Done—Vans are loaded and unloaded with fork-lift trucks or straddle-type carriers—three on a standard 53 ft 6-in. flat car, two to a 35-ft highway trailer, one on a city delivery flatbed truck.

Locking device installations which permit loading of three vans on a rail flatcar in about six minutes cost about $500 per flat car. The installation does not alter or restrict the flat car's normal use when not carrying vans.

New Features — Advantages of the system claimed by Clark: 1. Elimination of high-cost waiting of trucks. Trucks when not carrying vans can be put into other operations. 2. Less transferring, from

truck to railroad back to truck etc., is necessary, to reducing damage claims. 3. Railroad switching operations will be reduced. Vans can be unloaded from middle of train easily, eliminating switching to side track. 4. One man with a forklift truck or straddle carrier can handle the entire loading and unloading operation.

New Safety Record Announced

Co-operative safety drives of employers and employees are paying off. James P. Mitchell, secretary of labor, announces that fewer workers than ever before were killed on the job in 1954.

All-industry work-death total for 1954 was 14,000, a drop of 7 per cent from 1953. Disabling work injuries were down to 1,860,000, falling 9 per cent below 1953 to the lowest total in 15 years.

From the high point reached in 1943, the number of fatalities has decreased 24 per cent, and the injury total 23 per cent, while total employment has increased 12 per cent.

Secretary Mitchell remarked: "An appreciable part of the reduction can be traced to declines in employment and shortened working hours. But these factors do not detract from progress made by safety movements."

Steel's Wage Bill Climbs

Average hourly payroll cost of wage earners in the iron and steel industry rose to a new high of $2.333 in 1954, reports the American Iron & Steel Institute. The average in 1953 was $2.267.

Based on a survey of 110 companies having about 97 per cent of blast furnace capacity and 95 per cent of steelmaking capacity, the report also shows that pensions, social security and insurance costs were higher, bringing the average hourly employment cost up to $2.51 as opposed to $2.44 in 1953.

The industry's total payroll was in excess of $2.9 billion, the second highest on record. Estimated average total employment was 611,000 in 1954 against 682,000 in 1953. Wage earners worked an average of 36.1 hours a week.

The total payroll for 1954 was off only 13.4 per cent from 1953. Steel production fell 21 per cent.

Annual Earnings of Selected Manufacturers

	1954	1953
Avco Mfg. Corp.	$ 3,639,436	$ 3,427,185
American Brake Shoe Co.	4,304,000	4,852,896
Bendix Aviation Corp. (Sept.)*	25,537,771	17,352,710
Budd Co.	6,292,424	10,829,303
Caterpillar Tractor Co.	25,129,239	20,254,514
Chapman Valve Mfg. Co.	1,348,271	851,327
Continental Fdy. & Mach. Co. (Nov.)*	3,454,500	3,577,054
Continental Motors Corp. (Oct.)*	4,542,748	6,023,812
Deere & Co. (Oct.)*	20,620,616	24,737,531
Ferro Corp.	1,883,000	1,548,424
General Motors Corp.	806,000,000	598,119,478
IBM Corp.	46,536,625	34,119,210
International Harvester Co. (Oct.)*	36,303,833	52,029,417
Kennecott Copper Corp.	77,858,531	88,753,873
Lakey Foundry Corp. (Oct.)*	139,749	433,939
Lamson & Sessions Co.	1,287,112	1,500,005
Olin Mathieson Chemical Corp.	35,343,000	31,843,000
Oliver Corp.	3,707,295	2,809,517
Rockwell Mfg. Co.	5,716,000	5,673,000
South Bend Lathe Works (Nov.)*	661,392	1,293,217
Standard Forging Corp.	439,917	880,437
Union Carbide & Carbon Corp.	89,779,271	102,783,442
United Drill & Tool Corp.	1,000,000	1,502,000
York Corp.	2,138,825	3,006,533

*Fiscal Year ended

Metalworking '54: A Good Year

Sales decreased but realistic efficiency programs and the end of federal excess profits taxes helped to keep net profit high for most companies

THOUGH there was a general sales dip, consolidated net earnings for most metalworking companies held steady in 1954. Strictly enforced economy programs and the end of federal excess profits taxes helped to bring about this result.

Trend—Parker Appliance Co.'s report for the last six months of 1954 reflects the general trend. Earnings were $586,480 on sales of $11,024,403. This compares with earnings of $531,523 on sales of $12,127,548 during the corresponding period of 1953. While sales decreased by $1,103,145, the net profit gain was $54,957. The company backlog at the end of the year was about $8 million.

Inventories were also cut in 1954. An example: Caterpillar Tractor Co. reduced inventories by more than $14 million, while dealers cut stocks by $15 million. As the accompanying chart shows, the company increased its net earnings by $4,864,725 over 1953.

Future—And 1955? Norge Corp., a subsidiary of Borg-Warner Corp., is optimistic, as is much of industry. Factory sales for products last month exceeded $15.1 million which was nearly equal to the entire first quarter of 1954.

Emerson Radio & Phonograph Corp. predicts a good year. Emerson has booked more orders for television receivers in the first quarter of the current fiscal year than ever before.

While these are only two companies out of hundreds, there is a wave of cautious optimism growing throughout metalworking.

Industry Seeks Priority Lists

Details for mobilized production planning are in two classified documents. Companies can see certain items if they can show "need to know"

THE FORMOSAN SITUATION is intensifying manufacturers' interest in the Production Allocation Program. The details for mobilized production planning are in two classified documents: The Department Preferential Planning List and the Alphabetical Register of Planned Wartime Materiel Suppliers.

The Preferential Planning List is a compilation of some 1000 first-priority military items which call for mandatory advance planning by the Army, Navy and Air Force. This list represents the hard core of hard-to-get items over which DOD must exercise control and assure priority.

Information Needed—All multi-plant firms are interested in getting a look at this list so that they can include some of these priority items in their advance production planning programs. They also want to spot additional items which might fit into their production facilities. Every firm wants to take on sufficient defense assignments to assure that they will have sufficient materials, equipment and supplies to keep all plants in operation in the event of another war.

DOD states that while the list is classified, arrangements can be made to allow companies to look at selected items, providing they can show a "need to know."

The Alphabetical Register of Planned Wartime Materiel Suppliers is a list of some 34,000 firms participating in the DOD Industrial Mobilization Planning Program.

Some May See—Though classified confidential, a properly identified official of a firm listed in the register may look at an entry or entries pertaining to his organization. This enables a company to determine approximately how it will fare under mobilization in getting materials, equipment and supplies.

If you are interested in getting a look at either document, first get copies of two booklets: "Purchased Items and Purchasing Locations of the Department of Defense" and "How to Sell the Department of Defense." These booklets may be obtained from the Central Military Procurement Information Office, Pentagon, Washington 25, D. C. From these booklets you get the location of offices that procure the military items you make or could make and the Armed Services Procurement Planning Officer who will be in charge.

Snag—Another point: If you strike a snag and do not get an advance production allocation for an item in the Preferential Planning List you may turn to the ASPRO for help. He may be able to line up some advance production assignments from the department or supplemental lists of the three services.

Ralph R. Baldenhofer

BDSA Appoints Director

Ralph R. Baldenhofer has been appointed director, Metalworking Equipment Division, Business & Defense Services Administration. Mr. Baldenhofer is on leave from Thompson Grinder Co. where he is executive vice president and treasurer. He succeeds Graham E. Marx who has resumed his duties as vice president and general manager, G. A. Gray Co., Cincinnati. Charles J. Kraven, on loan from Republic Steel Corp., Cleveland, has been appointed chief, Business Research and Analysis Branch, Iron and Steel Division, BDSA. He replaces Allen S. Oram, who has returned to his duties with U. S. Steel Corp., Pittsburgh.

Vance Committee Named . . .

Harold S. Vance, chairman of the executive committee, Studebaker-Packard Corp., has been appointed chairman of the Advisory Committee on Components & Production Equipment. This committee, which serves in an advisory capacity to the Director of Defense Mobilization, has as its main functions to: 1. Devise a program designed to eliminate the shortage of components which might arise during a national emergency. 2. To review the federal policies and programs with respect to machine tools and production equipment.

Serving with Mr. Vance will be William C. Foster, president of Manufacturing Chemists' Association Inc., Washington; LeRoy Lutes, president, Pacific Tire & Rubber Co., Oakland, Calif.; John L. McCaffrey, president, International Harvester Co., Chicago; K. B. Wolfe, president, Oerlikon Tool & Arms Corp. of America, Asheville, N. C.; and Earl W. Mills, president, Foster Wheeler Corp., New York.

Defense Orders Announced . . .

Small business is going to get its share of defense orders. More than $400 million in military purchases has been set aside for award to small firms under a Small Business Administration — Department of Defense program. Bidding is restricted exclusively to small firms.

Small companies have already received more than 2600 contracts, amounting to approximately $180 million.

SPECIFY SIRVENE

There are lots of reasons why so many leading machine tool builders agree on Sirvene wipers. You'll find them tops in design, quality and service.

Sirvene wipers are molded as precisely as the setting on a lathe. They must be . . . to exclude fine abrasives and chips, water emulsions or other corrosive materials from bearings. Another reason is their broad resistance to oils, chemicals, solvents, temperatures, abrasion and wear. New metal face and metal cased wipers furnished 22" long with smudge-free, grey synthetic rubber.

Whether you require wipers of standard or special designs for critical service, investigate Sirvene. You'll find the unmatched experience of C/R Sirvene engineers of great help in meeting your specifications.

GET the basic information on this versatile material. "Engineering with Sirvene" will be sent on request at no charge.

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SCIENTIFICALLY COMPOUNDED ELASTOMERS

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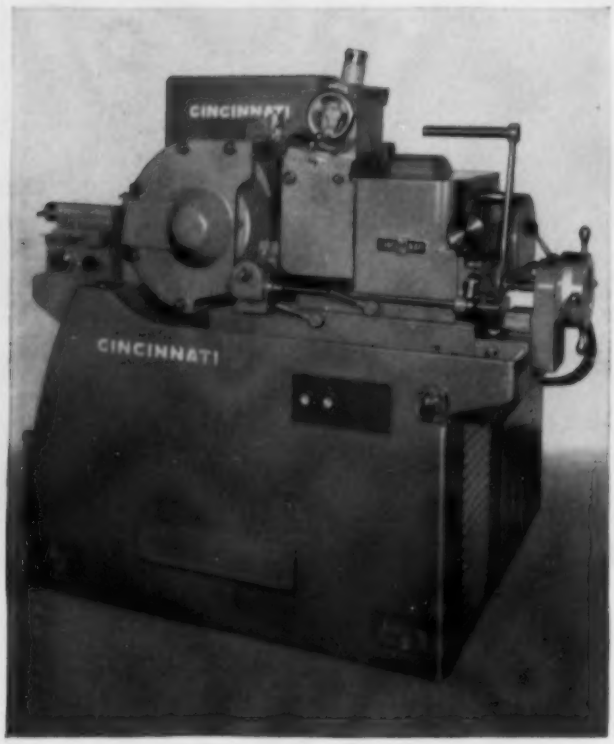
You'll find New Profit Possibilities

In NEW CINCINNATI FILMATIC

No. 0 CENTERLESS GRINDERS



CINCINNATI FILMATIC No. 0 Centerless Grinder. Catalog No. G-640.

In the small parts precision grinding category, a substantial profit potential will be found in the new CINCINNATI FILMATIC No. 0 Centerless Grinder. Exclusive Cincinnati features, based upon 33 years of centerless experience, have been retained: Filmatic grinding wheel spindle bearings; "bed-rock" mounting of grinding wheel spindle; simple, direct truing of wheels. And now Cincinnati offers new advantages such as extra low maintenance; an extra measure of production with handwheel selection of infinitely variable regulating wheel speeds; higher quality finish and closer limits of accuracy than ever before. Catalog No. G-640 contains the complete story. Write for a copy today.

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CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES

U.S. export firms will get better recognition as the . . .

U.S. Sells Itself in Djakarta

TWENTY-THREE international fairs in which American industry will be asked to participate jointly with the U.S. government have been selected. More are being considered.

First of the European fairs under the 1955 program will be the International Spring Fair at Frankfurt, Germany, Mar. 6-10. More than 200 products—from an eggbeater to a tractor—will be exhibited. Theme of the central exhibit is "Main Street—U.S.A.," and will illustrate industry's contributions to the comfort and efficiency of the home.

Lucky Thirteen—Actually, 13 of the fairs thus far approved for the government program will be held in Europe this spring. Besides the Frankfurt Fair, they are: Italian Agriculture Show, Verona, Mar. 13-21; Royal Netherlands Industrial Fair, Utrecht, Mar. 22-31; International Samples Fair, Milan, Italy, Apr. 12-27; International Trade Fair, Lyon, France, Apr. 16-25; International Trade Fair, Brussels, Apr. 23—May 8; International Trade Fair, Liege, Belgium, Apr. 23—May 8; German Industries Fair, Hannover, Apr. 24—May 3; Valencia Fair, Valencia, Spain, May 1-20; British Industries Fair, London, May 2-13; International Trade Fair, Paris, May 14-30; 10th International Mediterranean Fair, Palermo, Italy, May 25—June 10; and the International Samples Fair, Barcelona, Spain, June 1-20.

Two more of the selected fairs will be held in Europe this fall: Berlin Industries Fair, Sept. 25—Oct. 10 and Vienna Trade Fair, Sept. 11-18.

Look to the East—In the Near and Far East selected fairs include the First Tokyo International Trade Fair, Tokyo, May 5-18; Pakistan International Industries Fair, Karachi, Sept. 2—Oct. 2; International Economic Fair, Djakarta, Indonesia, Aug. 12—Sept. 15; India Industries Fair, New Delhi, Oct. 29—Dec. 15; Constitution Fair, Bangkok, Thailand, Dec. 7-18; Izmir International Fair, Izmir, Turkey, Aug. 20—Sept. 20; International Trade Fair, Salonika, Greece, Sept. 5-26; and the International Trade Fair, Damascus, Syria, September, 1955.

Roy F. Williams, director of Commerce department's new Office of International Trade Fairs, says: "With evidence that more and more industries will be taking part in these fairs, I have reason to expect we will continue the good results we had at Bangkok last December (when) our exhibit . . . won first prize for originality."

Invitational—While participation in the central exhibit is by invitation only, many manufacturers are considering exhibits at international fairs for the first time in 1955 because there will be a rallying point for American activity. Previously, exhibits of individual American firms tended to get "lost" in the welter of national exhibits of other countries.

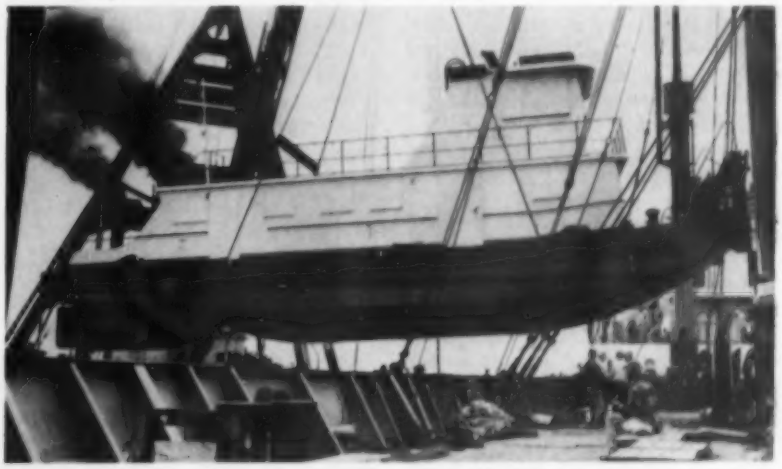
Reason for the U.S. interest in the trade fairs is not just to help keep American exhibits from getting lost, however. It's recognition of the political hay Russia has been able to reap at these fairs through subtle propaganda and outright displays.

Cold War—Said H. Struve Hensel, assistant secretary of defense: "At the recent Damascus trade fair, the steel and aluminum exhibits for the Russians surprised technicians from other countries and created considerable interest among prospective buyers. The Russians displayed threadings and couplings for oil well pipes which it had been thought could be produced only by certain American and Western European firms . . ."

Part of the message which will be carried by the American central exhibits at foreign trade fairs is that the American way results in more things for more people no matter where they live.

Export-Import Notes

Koppers Co. Inc. will design, engineer and procure part of a blast furnace with 28-ft hearth to be built at Aviles, Spain . . . German investment is being considered in a Franco-German venture to exploit iron ore deposits near Ft. Gouraud on the French Moroccan border . . . Westinghouse Electric International Co. has just finished its biggest year for exports of appliances and related products, says A. B. McCloskey, consumer products manager.



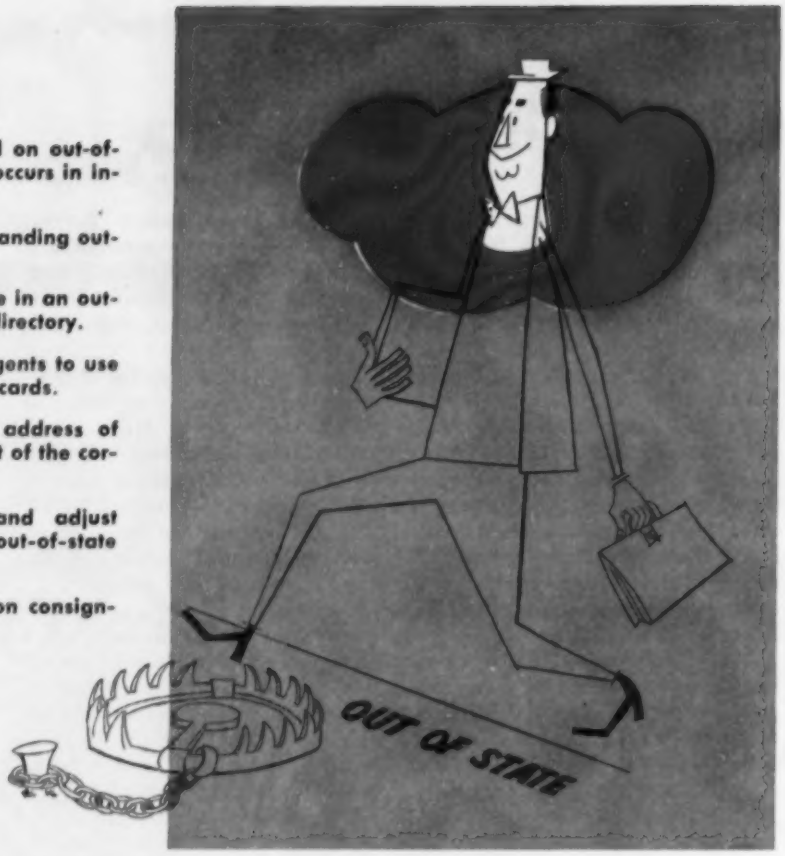
New Orleans to Buenos Aires by Piggyback

A new type river towboat that has answered many problems in the towing operations on U.S. inland waterways is shown enroute to Argentina to aid that country's river transportation system. A 70-ft, 580-hp vessel, it is one of five Ram class towboats completed last year at Dravo Corp.'s Pittsburgh yards

Tax Traps

To avoid possibility of being taxed on out-of-state business which you consider occurs in interstate commerce:

1. **Consult your attorney before expanding out-of-state operations.**
2. **Don't list your corporation's name in an out-of-state telephone or building directory.**
3. **Don't allow representatives or agents to use company stationery or business cards.**
4. **Don't advertise that the home address of your out-of-state salesman is that of the corporation.**
5. **Don't have salesmen repair and adjust equipment or collect bills in out-of-state locations.**
6. **Don't ship samples out-of-state on consignment.**



Out-of-State Taxes Trap Unwary

IS ANYTHING going to be done about intra and interstate taxation? Manufacturers complain, and they are not alone, that only a legal genius can understand the battery of confusing local tax laws facing metalworking companies today. One midwestern firm relates that it spent $400 in 1954 to discover that it owed $50 to a municipality.

Corporate Trust Co., New York, points out in its booklet, "Corporate Tightrope Walking," the legal problems a company faces when expanding activities into other states. It advises: "Consult an attorney."

Jumbled—Taxes are not specific. This makes it possible for a company to operate for several years in ignorance of a prevailing law. State legislatures are always proposing more tax laws to meet the spiraling cost of government.

"The desire of states, cities and townships for more taxes alerts manufacturers to a persistent and often costly problem," states the Materials Handling Institute, Pittsburgh. As examples: XYZ Corp. registers in New York but has a manufacturer's agent represent the firm in Pennsylvania. The agent, in listing himself as an XYZ representative, makes the corporation liable to taxation by the commonwealth of Pennsylvania.

More of the Same—A Kansas company had no Oklahoma office or stock of goods. The firm delivered its product to Oklahoma in rented trucks. Kansas courts ruled the company owed $1300 to Oklahoma for sales tax on products delivered there. Reciprocal tax statutes in 22 states allow one state's court to award a tax judgment to another state.

Manufacturers are also forced to watch for fine lines of distinction. If company A in Ohio sells equipment to company B in Indiana, and B comes to A in common carriers to pick up the merchandise, then A is conducting only intrastate business. Company B would have to pay the Ohio sales tax and possibly other fringe taxes for bringing new material into Indiana.

Possibility—Say company A has a representative from the home office go to company B. He sells the product at B. The contract is signed in B's office. A is then dealing in interstate commerce and must declare itself as a foreign operator subject to a new set of tax laws. Generally, tax burden is heavier for companies operating as a foreign firm than as an intrastate organization.

Said one lawyer to STEEL: "Is anyone going to do anything about this hodgepodge or will a harassed management be forced to take it on the chin? Tax laws for intrastate and interstate commerce could at least be understandable!"

Meanwhile watch out for the tax traps as listed above.

Industrial Wheel Sales Turn Up

Manufacturers will clear the floor for $24 million in sales in 1955 by developing new, improved products. Booming materials handling holds key to future growth

INDUSTRIAL WHEELMAKERS are predicting that the industry will roll in sales of about $24 million this year, up at least 10 per cent from 1954.

Surveyed by the Caster & Floor Truck Manufacturers Association, 16 companies indicated that first quarter sales would be up 16 per cent from last quarter, 1954. Geneva Metal Wheel Co., Geneva, O., estimates: "The outlook for the year and at least the first six months is for a 40 per cent, or better, increase in sales from last year's." Only one company reporting to the association predicted a drop.

Sales Spur — Perhaps the best reason for optimism, remarks H. A. Ford, vice president and sales manager at Geneva, is the "long-term strength of the materials handling industry." Most industrial wheel sales are made to materials handling, which is riding high on industrial investment and interest in automation.

Wheelmakers are plagued by the almost infinite variety of sizes, shapes and types of wheel they have to produce. N. Warshaw, manager of the materials handling division of Market Forge Co., Everett, Mass., reports: "One large company that had been in business for over 30 years stopped making wheels two years ago. The big reason was the terrific variation in diameters and face widths and the large number of small orders. Nobody bought their business, I don't believe they could give it away!"

Standards—A strong movement towards standardization is shaping up. Association members are working on cutting from 86 to 36 the number of outside diameters of wheel sizes regularly produced, plus standardization of the hub, axle and rim dimensions and load ratings. Following the Air Force's lead (USAF MIL-W-8005), the services are helping by adopting standard specifications for all pneumatic disc wheels.

Wheelmakers are backing their hopes by concentrating on product improvement and development. Ralph D. Mount, assistant sales manager of Bassick Co., Bridgeport, Conn., notices increased use of aluminum-cored wheels for tough jobs. "The trend is toward more rapid materials movement, with minimum power expended."

New Products—That means bearings, and many observers are noticing increased use of antifriction bearings in all types of wheels, especially where loaded above 500 lb. Pneumatic tubeless wheels are making rapid headway in the shock-absorbing applications, as are varied designs of spring casters and wheels. Plastic and powder metal wheels are also gaining ground, and if you want neoprene or other special finishes, you can get them.

With orders on the way up and inventories lower than for some time, the short-term outlook is good. For the long haul, makers are betting on speed, convenience and reduction of labor costs to plump their sales.

Goodyear pneumatic wheels cushion shock on rock conveyor

PRODUCTION PROBLEM?

if you use flat-rolled steel talk to a specialist

PROBLEM With present designs and manufacturing facilities, the auto industry needs wide coils of sheet steel with a minimum number of welds. These welds must be cut out before steel goes into the big presses—a costly, time-consuming process.

SOLUTION As a prime supplier to the automotive and other industries, Great Lakes Steel has developed facilities which now produce wide coils of steel in greater lengths . . . drastically reducing the number of expensive welds in each coil. Result: important fabrication savings for our customers.

MORAL Whether you make autos, appliances, or farm machinery . . . if it's flat-rolled steel, you can't lose by talking to Great Lakes Steel—specialists in flat-rolled production and application for 25 years.

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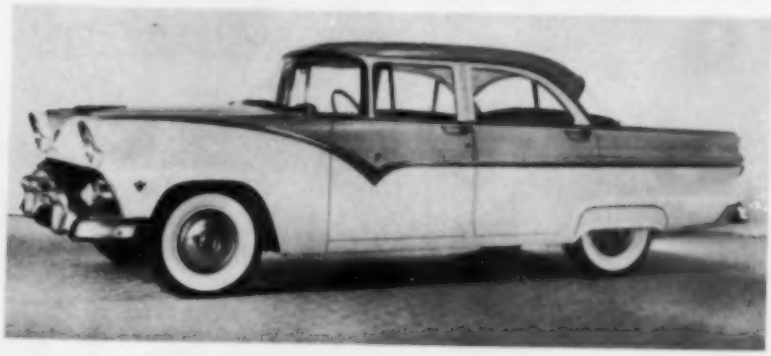
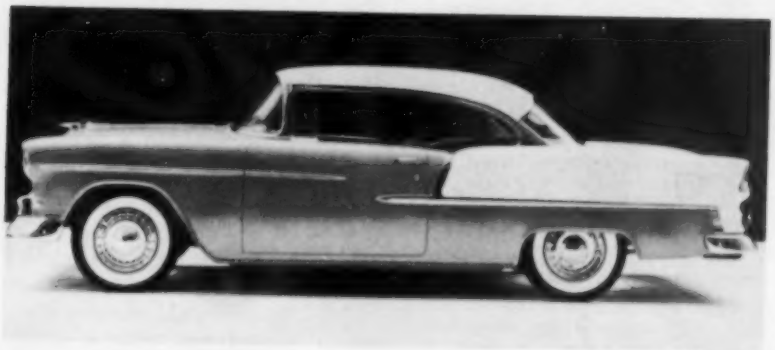


Ford



Chevrolet

Plymouth

Are They Too Much Alike?

THE AUTO INDUSTRY is entering a period of mechanical innovation, say auto engineers queried by STEEL. That means a fertile field for creative auto suppliers.

Since the tremendously creative early days of the auto industry, when virtually every mechanical idea used by it to date was tried out, periods of progress have tended to run in cycles, interspersed with periods of catching up. It is the end of a catching-up period in which the industry finds itself today, believe these engineers.

Reasons Why—There are a number of reasons for the cyclical phenomenon. Among them are the progress in highways which eliminated the need for high ground clearance and permits higher speeds; new technological developments which make economically feasible design ideas previously too costly; and perhaps the most important, the current competitive situation in the industry.

The most recent example of the absence of competitive forces in the industry was the immediate postwar period when anything with four wheels sold at list price, plus a little under the counter. As a result, some observers believe, cars today are monotonously alike. They point out that coil springs in front and semi-elliptics in the rear are used by all four makes, that V-8 engines offered by all but two are becoming standard and soon will replace the remaining sixes, that automatic transmissions of the torque-converter type or the fluid coupling with planetary-assist type are approaching universality and that the most distinguishing feature of most cars today is the pattern of the chrome trim.

Shading—Our subjective driving impressions tend to coincide with this belief. Visibility in most cars is similar; the ride-handling compromise is only shades different in most cases; top speeds all exceed the capability of drivers in today's conditions; and initial take off and passing acceleration feel much the same in the majority of cars, with a few hot and a few relatively cool.

There are a few general differences. Heavy cars tend to ride a bit better, stop better and have more performance as a class. Interior appointments are usually commensurate with the price of the car and its accepted status, though the low-priced cars of today look like the plush-wagons of only a couple of years ago. By contrast with the variety of products available to the buyer in Europe, for example, it is perhaps not unreasonable to say the American buyer's choice in cars is about the same as that in soap and cigarets.

Airflow Memories — Perhaps since the auto industry is selling in volume the same basic item to the same buying public, it's inevitable that autos should be much

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the same. Never to be forgotten among automen is the Chrysler Airflow which did much to end the last period of auto design divergence and heralded the period in which auto companies tended to creep forward as a group.

With competition ahead as far as the headlights reach, that period may well be ending, say designers whose best so far has been to offer wrap-around horsepower of a different color. There are many signs to confirm their belief.

Case in Point—Outstanding is the Packard torsion-level ride which most agree portends industry-wide use of a similar development both to improve ride and further lower over-all height. The soon-to-be-announced General Motors whirlaway transmission will utilize a double fluid coupling to eliminate the jerk in shifting. Packard's already announced Twin-Ultramatic and experimentation with infinitely variable transmissions of many types by every automaker promise innovations in this field soon.

The weight that has been added in the engine compartment by such goodies as power steering, air conditioning (which in the near future will become standard equipment) and the like will be reduced in the interests of handling, many believe. Better handling would be the one advantage of the V-6 engine or using alloy and nonferrous block materials. One of the finest engines in the world is the Porsche opposed-four which uses die-cast aluminum cylinders with chrome-plated bores. Reduction in weight, it must be remembered, is as good a way to gain performance as to increase torque and horsepower.

More Differences—The building of cars that are different, moreover, seems to be coming into its own as automaker philosophy. Such cars as the Packard Caribbean, the Cadillac Eldorado, the Ford Thunderbird, the Chevrolet Corvette, the Studebaker Speedster, the just-announced Chrysler C300 and the yet-to-be-announced Lincoln Continental are a growing indication of the catering to customer demand for cars that are different. Of similar ilk are the power packages offered in growing numbers.

Then, too, as the color race begins to reach the nauseating level, engineers point out that the cost of color can be spent on under-the-skin differences equally well. Plastic tooling and plastic parts continue to grow in impact. Plymouth this year, for example, claims to be the world's largest user of laminated plastic, thanks to its heating system. It is not too hard to visualize the time when, through plastic dies or optional plastic body panels, this external appearance of cars can be varied greatly at not much more cost than now expended for the color options. Plastic fenders also have dent-resistance and corrosion resistance to commend them as well as ease of repair.

Inside Changes—Interiors of the cars will be getting attention, too. Lincoln, for example, will introduce a new type steering wheel in which spokes drop down from the rim, then cut in to the steering column to reduce the deadliness of the steering column in case of collision. That means mounting the transmission selector on the dash as Chrysler products have done this year or putting an electrical switch system of some type on the center of the steering post where the horn button used to be.

Wrapping the whole situation up, one engineer says: "In the post-war period to date, most auto companies have taken the same technological advances to build the same type product their competitor was building with equally high quality and equally low price. The time is at hand when sameness isn't going to sell cars and technological know-how to make cars that are desirably different is getting a workout everywhere in the industry right now. It's putting creative fun back into engineering."

And it promises to put creative fun back into motoring as well.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,316†	594,558
February		573,801
March		672,485
April		676,248
May		621,262
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,926
Total		6,884,265†

Week Ended	1955	1954
Jan. 8	177,877	152,418
Jan. 15	184,362	149,841
Jan. 22	190,155	146,741
Jan. 29	190,468	143,654
Feb. 5	190,091	139,042
Feb. 12	191,000*	142,097

Source: Ward's Automotive Reports.
†Preliminary. *Estimated by STEEL.

Exhaust Notes

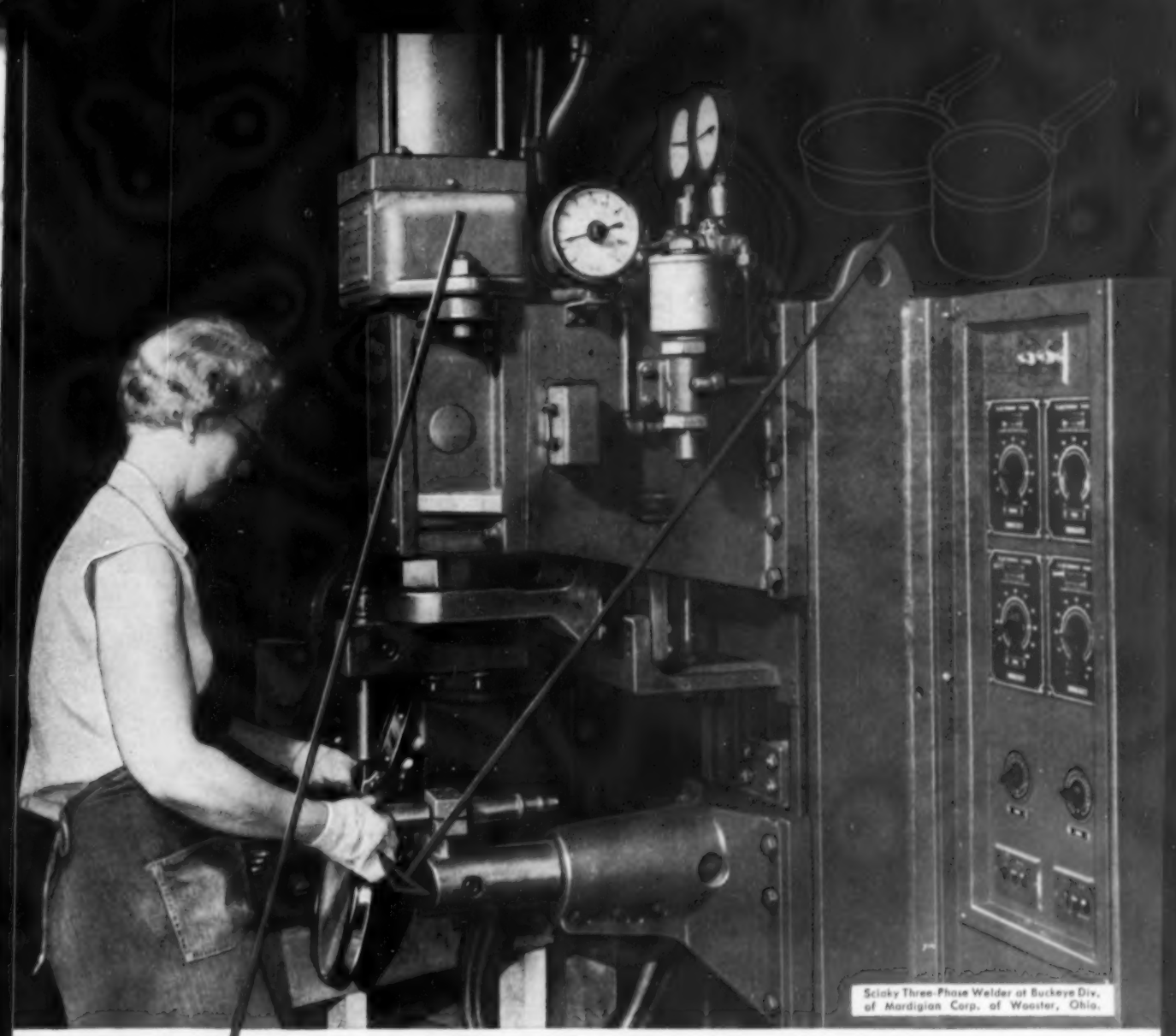
Experimental models of the Pontiac V-8 engine are being produced for GMC Truck & Coach Division. Now making the GMC six-cylinder engine, Pontiac will start supplying V-8 engines to the division soon.

The Corvette is on again for 1956, thanks to the Ford Thunderbird. Chevrolet, which had already dropped 1956 Corvette plans, found the Thunderbird too successful to ignore without loss of face. A new Corvette is in the works which, like the Thunderbird, will hang its pitch on a "livable" automobile with sports car performance.

The Thunderbird, incidentally, which started out with a glass fiber hard top, now comes equipped with a steel lid. The reason: Surface finish in the glass fiber items left something to be desired.

The Auto Manufacturers Association reports American automobiles have grown an average of only 6.1 in. in length during the past 14 years. The thing we can't figure out is why new cars are always a foot too long for the garage. And public garages, meanwhile, note that their floor capacity has been cut about 15 per cent.

Interesting in this regard were the shorter cars featured at the GM Motorama. Rival engineers scratched their heads, came up with one answer: GM is probably using the Motorama to smoke screen its over-all intentions. Regarded as serious, however, is the LaSalle. Most analysts agree it will be brought into the line to boost Cadillac up closer to the upcoming Lincoln Continental. Their idea: Recent increases in Cadillac capacity have been to make room for the new car and Cadillacs will be priced more exclusively. This sort of reasoning, however, makes Cadillac officials publicly turn purple with indignation that sets a standard of the world.



Sciaky Three-Phase Welder at Buckeye Div. of Mardigian Corp. of Wooster, Ohio.

PRODUCTION JUMPS 375%...

Costs Cut Sharply with Sciaky Patented Three-Phase Welders

FACTS ABOUT SCIAKY PATENTED THREE-PHASE

	SINGLE-PHASE	SCIAKY THREE-PHASE	SAVINGS
TRANSFORMER RATING	250 KVA	100 KVA	150 KVA
WELDING KVA DEMAND	650 KVA	325 KVA	325 KVA
LINE AMPS PER CONDUCTOR 440 V.	1,476 A.	430 A.	1,046 A.
POWER FACTOR	30%	85%	Greatly Improved
INSTALLATION COST—EST.	$10,500	$5,250	$5,250

Buckeye, with an enviable 52 year record of manufacturing, uses Sciaky patented Three-Phase Balanced Load, High Power Factor resistance welders extensively in fabricating high quality aluminum kitchenware.

Standard Sciaky Three-Phase Welders increased production 375% over riveting in joining a variety of handle mounting brackets to different size pans. Even beyond the savings in costs of rivets and related tooling, Sciaky Balanced Load Three-Phase with 85% power factor (compared to 30% for conventional single phase) and a 50% reduction in power demand, is far less expensive to operate than conventional single phase *unbalanced load* welders. Sciaky Three-Phase readily solves power problems, and further, installation costs are estimated at only half of single phase installation cost.

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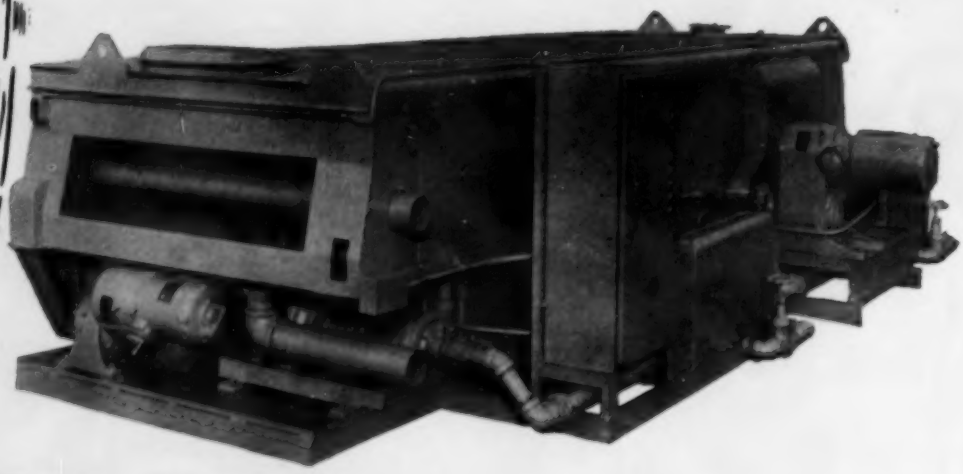

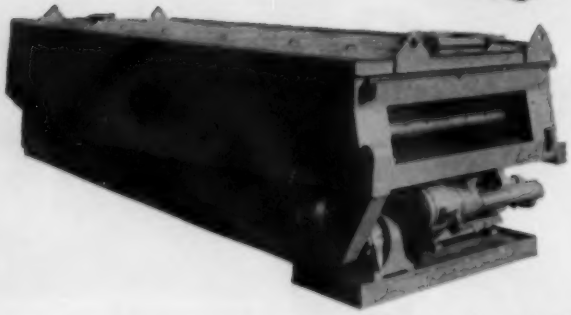

Power Spray Sheet Washers Compactly Designed By P-D To Speedily Wash Sheet Steel After Polishing

Here is a floor-space saving Sheet Washer, built to wash sheet steel after polishing. A comparative "shorty" in length, it handles sheets at high speeds—operating efficiently at a 75 foot per minute gait. P-D equips this Power Spray Sheet Washer with a powered roller conveyor, a powered brush, and a high pressure blow-off. Its compactness saves many important square feet of plant space.

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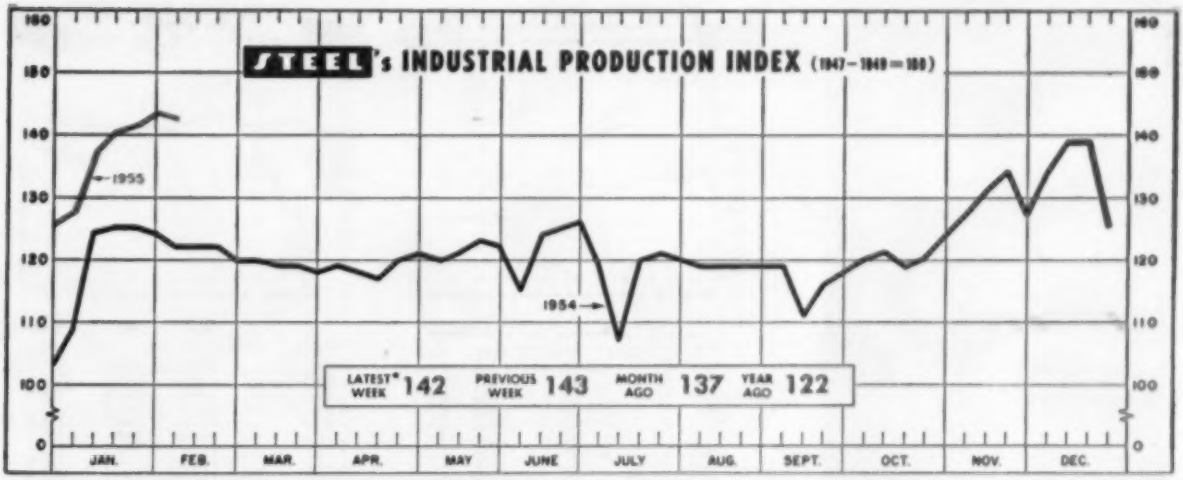

*Week ended Feb. 5. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

Record Auto Production: Ogre or Insurance?

FACT AND FANCY about the auto industry are buzzing around faster than a bee in a honeypot. Comments range all the way from "mad production race" to "strike insurance."

One thing's sure. The industry is running at record or near-record levels. And it's going to keep on going that way into the second quarter. March could be the highest production month of all time, says *Ward's Automotive Reports*. That would mean a record quarter of about 2 million units.

Halfway—Some 1.2 million 1955 models were built in the closing months of last year. Add in a 2 million first quarter, and you get 3.2 million cars turned out in a little over 5 months. That means at the end of March the industry will already be well past the halfway mark of the 5.5 to 5.8 million cars that will probably be built during the current model run.

Strike insurance is the popular guess as to why the automotive wheels are locked in high gear. The auto people themselves say it's because of high demand. Some stockpiling for the traditional spring buyers is also involved. The answer is that it's probably some of all three.

Output Leads — For example, January new car sales were close to 500,000. But production was close to 660,000, meaning output exceeded sales by about one-third. Part of the gap was likely taken up by orders placed late last year but not all of it, because, says *Ward's*, dealer stocks are going up.

From the dealers themselves you seem to be able to get almost any kind of comment you are looking for. A few are going out of business, others talk about bootlegging and reduced profit margins. Some dealers are overstocked; other can't get enough cars.

Not Bad—But in spite of any grousing, the majority plans to stay in business for a good while. Business could always be better,

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,110	2,070	1,774
Electric Power Distributed (million kwhr)	9,985[1]	10,003	8,674
Bitum. Coal Output (1000 tons)	8,830	8,500	8,405
Petroleum Production (daily av.—1000 bbl)	6,656[1]	6,677	6,271
Construction Volume (ENR—millions)	$279.9	$258.5	$194.3
Automobile, Truck Output (Ward's—units)	190,091	190,468	139,042
TRADE			
Freight Car Loadings (unit—1000 cars)	639[1]	642	624
Business Failures (Dun & Bradstreet, no.)	250[1]	255	238
Currency in Circulation (millions)[3]	$29,758	$29,752	$29,930
Dept. Store Sales (changes from year ago)[3]	+1%	+10%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,258	$19,388	$20,408
Federal Gross Debt (billions)	$278.5	$278.5	$274.8
Bond Volume, NYSE (millions)	$19.6	$19.3	$20.9
Stocks Sales, NYSE (thousands of shares)	16,271	16,811	8,936
Loans and Investments (billions)[4]	$85.7	$85.4	$80.1
U. S. Gov't. Obligations Held (billions)[4]	$36.4	$36.6	$33.3
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	226.8	215.8	203.3
All Commodities[7]	110.2	110.1	110.6
Commodities Other Than Farm & Foods[7]	115.2	115.2	114.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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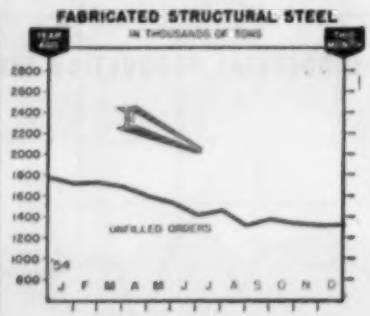
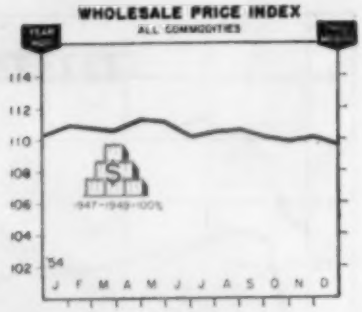
THE BUSINESS TREND



	Shipments		Backlogs	
	1954	1953	1954	1953
Jan.	245.6	241.4	1,686	2,180
Feb.	253.1	251.1	1,697	2,128
Mar.	285.4	266.3	1,645	2,155
Apr.	293.5	263.2	1,566	2,166
May	253.9	263.6	1,490	2,170
June	290.3	274.6	1,391	2,153
July	265.2	230.3	1,429	2,134
Aug.	272.5	251.1	1,270	2,123
Sept.	265.4	255.6	1,329	2,041
Oct.	258.4	295.5	1,294	1,927
Nov.	228.7	257.8	1,280	1,804
Dec.	223.5	266.9	1,281	1,741
Total	3,135.5	3,117.6		

American Institute of Steel Construction.
Charts Copyright 1955 STEEL.



	1954	1953	1952
Jan.	110.9	109.9	113.0
Feb.	110.5	109.6	112.6
Mar.	110.5	110.0	112.3
Apr.	111.0	109.4	111.8
May	110.9	109.8	111.6
June	110.0	109.5	111.3
July	110.4	110.9	111.6
Aug.	110.5	110.6	112.2
Sept.	110.0	111.0	111.7
Oct.	109.7	110.2	111.1
Nov.	110.0	109.8	110.7
Dec.	109.5	110.1	109.6

U. S. Bureau of Labor Statistics.

but for most it's still not too bad.

And dealers are getting more assistance from the auto companies. More management and sales helps, especially, are in the works or are already available. Row after row of new cars parked on a factory lot lose their luster if they stay there too long.

Plans—But, apparently, the producers are planning to keep them moving because here's what they have in the books for the immediate future: Chrysler is boosting output still further; Ford says the continued upsurge in demand has meant maximum overtime schedules; General Motors plans no letup from a record January.

Among the Independents: Studebaker is working overtime, but Packard is plagued with component supply troubles. American Motors (Nash and Hudson) is just about hitting its stride after a late start. Willys has the heaviest programs since mid-June.

Construction: Leader Again . . .

Another industry with heavy programming well into 1955 is construction. F. W. Dodge Corp. reports January contract awards at over $1.5 billion, up 31 per cent from the same month of 1954.

The January figure, highest on record for an opening month, is of special interest because it represents firm commitments for large sums of money to be spent in coming weeks and months. The January, 1954, report foreshadowed record-smashing activity.

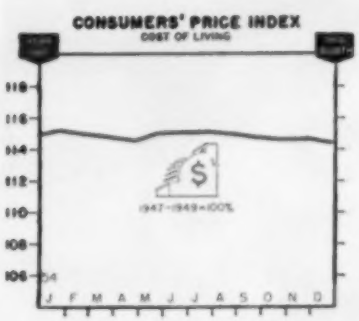
Residential building accounted for a large share of the high monthly total. But, says Thomas S. Holden, Dodge vice chairman, there was also a 19 per cent increase in nonresidential building.

Heavy construction contract awards thus far in 1955 are running 64 per cent over last year's, says *Engineering News-Record*. Federal and private awards are doubled.

Durables Come Back . . .

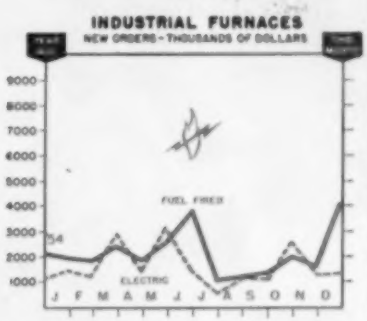
Sales by durable goods industries in 1954 were about 10 per cent under 1953's, says the Commerce department. Decreases in durables business went pretty much across the board, topped by a 20 per cent fall in primary metals. Nondurable goods were relatively unaffected by the 1954 dip.

Durables, though, did finish the year on a rising tide. But no flood is in prospect. New ordering is showing some strength.



	1954	1953	1952
Jan.	115.2	113.9	113.1
Feb.	115.0	113.4	112.4
Mar.	114.8	113.6	112.4
Apr.	114.6	113.7	112.9
May	115.0	114.0	113.0
June	115.1	114.5	113.4
July	115.2	114.7	114.1
Aug.	115.0	115.0	114.3
Sept.	114.7	115.2	114.1
Oct.	114.5	115.4	114.2
Nov.	114.6	115.0	114.3
Dec.	114.3	114.9	114.1

U. S. Bureau of Labor Statistics



	Fuel Fired*		Electric	
	1954	1953	1954	1953
Jan.	1,865	3,540	1,374	1,655
Feb.	1,758	3,996	1,093	1,672
Mar.	2,346	3,607	2,828	1,301
Apr.	1,734	3,017	1,262	1,796
May	2,423	2,609	3,065	1,799
June	3,724	2,550	1,261	2,095
July	987	2,017	456	2,246
Aug.	1,117	5,465	1,052	1,904
Sept.	1,241	3,019	1,007	873
Oct.	1,950	1,975	2,496	1,539
Nov.	1,534	1,692	1,196	1,256
Dec.	4,111	2,013	1,265	1,014

*Except for hot rolling steel.
Industrial Heating Equipment Assn. Inc.

mainly in primary metals and transportation equipment. Backlogs at the end of the year were still $11 billion under the tally of 1953 despite the order pick up.

Inventories showed a slight increase in December. No really strong upward movement has shown up, though rising trends seem plentiful. Precluding large gains is the slowness of business loans to metalworking. For all of 1954 inventories dropped $2.8 billion, mostly in durable goods.

Appliances Gain . . .

Appliance makers can look back on 1954 as a pretty good year. For example, sales of household washers, dryers and ironers were 4,474,168 units, almost a half-million more than midyear industry predictions. Sales were up 4.5 per cent over 1953's, with dryers the main booster. And 1955 has all the indications of being at least as good a year as last.

American Home Laundry Manufacturers' Association puts sales of washers at 3,490,212, up 1.8 per cent from 1953's; dryers, 897,751, up 28.9 per cent; and ironers, 86,205, down 44.2 per cent.

Television set producers did all right, too. Factory production of over 7.3 million sets was second only to 1950's production, says the Radio - Electronics - Television Manufacturers Association. Sales reportedly paralleled production, but dealers reportedly still have heavy inventories because they started 1954 with a sizable hangover from 1953. A slow first half didn't help matters much either.

Radio production last year declined about 3 million but wound up around 10.4 million. About one-third of the drop was in auto radios. Radios showed some signs of snapping back in December, so things may be better in 1955.

Trends Fore and Aft . . .

Electric power output went over 10 billion kilowatt hours in a week for the first time, according to Edison Electric Institute. . . . The new order index of industrial supplies and machinery for December was 148.8 (January, 1948=100), the highest point in 15 months, reports American Supply & Machinery Manufacturers' Association. . . . Cleveland, center of diverse metalworking activity, in January had its sharpest employment pickup in over a year, says that city's Chamber of Commerce. Auto suppliers were a strong factor.

• Edited by GEORGE BLACK

ADVANCED KNOW-HOW SERIES

An interesting series of case histories showing how advance foundry technics have brought new dimensions to the scope of high alloy castings is being prepared by our Foundry Products Division. Each study will cover a specific part which because of its complexity or because of unusually high quality requirements, or both, presented a problem that couldn't be solved with conventional foundry practice. The methods used to achieve sound castings for these "castings which couldn't be cast" will be explained in detail. If you would like to receive this series as it is prepared, please drop us a note on your letterhead.

V2B AVAILABLE IN NEW FORMS

A short while back we licensed both Janney Cylinder Company and Crucible Steel Company of America for the production of V2B centrifugally cast cylinders and wrought forms respectively. We're pleased to announce that tests conducted by both companies show our own data to have been conservative. If your product requires a gall and corrosion resistant stainless alloy—with a hardness of 363 Brinell and better—we suggest you contact Janney, Crucible or ourselves for the facts on V2B.

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To meet the increased demand for ELC grade, the extra low carbon stainless steel which permits welding without subsequent heat treatment, our Foundry Products Division has expanded its melt capacity by more than six tons per day. The cost cutting advantages of cast-weld construction plus the increasing number of processes requiring field fabrication seem to be the stimulus.

Vanton Pump & Equipment Corp. announces the removal of its executive and sales offices from the Empire State Building in New York City, to the plant location at 201 Sweetland Avenue Hillside, New Jersey. The move is the result of increased design and production activity which requires closer liason between operating and management levels.

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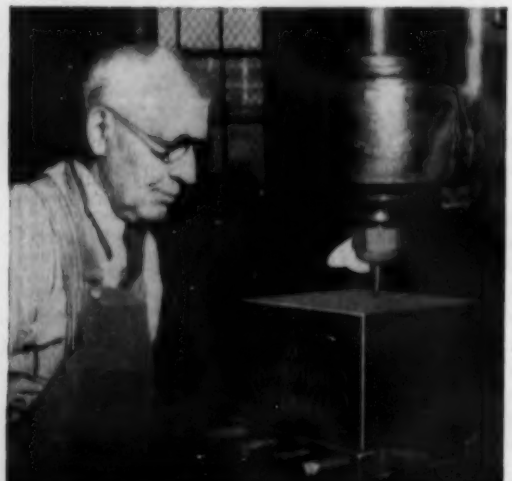
precision demands the best material



Among industry's top die sinkers, Hardtem Die Blocks have earned a time-honored reputation for dependability. Above is Mr. Justus Johnsen, owner and operator of his own shop in Hartford, Conn. (He is shown with his son in the feature illustration.) Mr. Johnsen, though 85 years old, still continues his daily work—applying his wealth of experience and knowledge to the trade he has worked in for so many years.

That's why users buy and rely on Heppenstall Hardtem Die Blocks—for the consistent performance they can trust.

Here's what Hardtem Die Blocks mean to Better Production!

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2. They withstand heat.
3. They are uniform in hardness.

Here's why Hardtem Die Blocks assure better results!

1. They're built of a special patented Heppenstall Steel.
2. They're carefully forged and heat treated to provide the wear resistance for which they are recognized throughout industry.
3. Their quality is under constant study and development by Heppenstall's Engineering and Research staff.

Make Hardtem your standard die block specification. Heppenstall Company, Pittsburgh 1, Pa. Sales Offices in principal cities.

HEPPENSTALL

. . . the most dependable name in die blocks

T. M. STONEROD
. . . Brooks Oil gen. sales mgr.

CHARLES LeB. HOMER
. . . heads Stran-Steel Division

ARTHUR K. OLDIN
. . . Tourek Mfg. v. p.-sales

Brooks Oil Co., Pittsburgh, appointed **T. M. Stonerod** general sales manager. As assistant to the vice president of sales and engineering, he formerly served as head of Brooks' mining sales division.

G. Lupton Broomell Jr. was appointed chief engineer, **Leeds & Northrup Co.**, Philadelphia.

Joseph W. Kennedy Jr. was named vice president in charge of Copperweld Steel Co.'s **Ohio Seamless Tube Division** plant at Shelby, O. **Reid Pittenger** was named manager of industrial relations; and **Raymond E. Dewey**, manager of operations.

Everett A. Sisson was made sales manager, and **H. L. Burton Jr.**, assistant sales manager for **Osborn Mfg. Co.'s** Brush Division, Cleveland. Both appointments are effective Mar. 1. Mr. Sisson replaces **George Lundberg**, who resigns to enter business for himself.

John B. Dempsey was named manager, electric tool sales, **Thor Power Tool Co.**, Aurora, Ill.

Frank R. Benedict was made manufacturing engineering manager of **Westinghouse Electric Corp.'s** Sturtevant Division, Hyde Park, Mass. **John F. Myers**, for 32 years an executive in the company's consumer products organization, was elected a vice president.

Charles LeB. Homer was elected president, **Stran-Steel Division** of Great Lakes Steel Corp., National Steel Corp., Pittsburgh. **J. E. Bowen** was elected vice president-sales. Mr. Homer is executive vice president of North American Smelting Co., and president of North American Copper Co. He will assume his position with Stran-Steel on March 15.

George L. McKenna, for nine years manager of RCA's industrial products department, was elected vice president-sales at **Toledo Scale Co.**, Toledo, O.

John W. Lindsey was made director of purchases for **Jones & Laughlin Steel Corp.**, Pittsburgh. He formerly was general purchasing agent.

Frederic L. Moffet was appointed chief metallurgist at **Crucible Steel Co. of America's** Park Works in Pittsburgh to succeed **William H. McCormick**, appointed manager of sales, Park Alloy & Carbon Division. **Richard A. Biggs** was made manager, product development, stainless division.

P. A. Burns was made sales manager at the Passaic, N. J., conveyor machinery manufacturing plant of **Hewitt-Robins Inc.** He is succeeded as Cleveland district manager by **A. J. Ball**, formerly sales engineer in Detroit.

Arthur K. Oldin was elected vice president-sales, **J. J. Tourek Mfg. Co.**, Chicago. **Robert G. Saxon** was appointed sales manager, screw machine products division.

Edgar F. Jackson was elected vice president-sales, **Ben-Hur Mfg. Co.**, Milwaukee. He was sales manager.

At **Rockwell Mfg. Co.'s** meter and valve division, Pittsburgh, **Norman W. Rowand**, general manager, was named assistant to the vice president. In addition to special assignments, he will head the register and drill unit divisions. **Paul A. Mankin**, chief engineer, was named general manager. **Arthur W. Krause**, assistant general manager, was named factory manager.

Paul A. Pitt was named chief engineer, **Solar Aircraft Co.**, San Diego, Calif., and **William C. Heath** was made executive engineer-marketing.

Roger E. Bremer was elected a vice president of **Studebaker-Packard Corp.**, Detroit, responsible for product planning and programming.

At **Chrysler Division**, Chrysler Corp., Detroit, **Frederick A. Wunderlich** was made chief staff assistant, and **G. T. Poirier**, executive assistant to the vice president-manufacturing; **C. G. Bauer**, general works manager, and **L. S. McCune**, assistant general works

G. A. GILBERTSON

R. L. BEYERSTEDT

. . . executive v. p.s of Frank G. Hough Co.

manager; **John Hutchinson**, works manager, and **Alan C. Lewis**, assistant works manager, body and car building division; and **Robert S. Phillips**, general superintendent, motor machine and assembly division.

Harold R. Suter joined **Catalytic Combustion Corp.**, Detroit, as vice president-research and development.

Edwin H. Webster was promoted from general manager to vice president in charge of production and purchasing by **Luria Engineering Co.**, Bethlehem, Pa.

G. A. Gilbertson and **R. L. Beyerstedt** were promoted to executive vice presidents of **Frank G. Hough Co.**, Libertyville, Ill. Mr. Gilbertson, formerly vice president in charge of sales, advertising and service, is now executive vice president and general manager. Mr. Beyerstedt, formerly vice president and chief engineer, is now executive vice president in charge of engineering and product development, with additional responsibilities in the company's accelerated product development program.

Edward T. McNally was elected president, **McNally Pittsburg Mfg. Corp.**, Pittsburg, Kans. He succeeds his father, **Thomas McNally**, who becomes chairman of the board. **Robert L. Pate** was promoted from chief engineer to vice president. **H. J. Patterson**, formerly director in charge of engineering, was elected vice president.

At **American Chain & Cable Co.'s** American Chain Division, York, Pa., **Earl S. Lathrop** was made plant manager, and **H. L. Cummings**, assistant plant manager. **Niles L. Kohler** was made plant manager, malleable iron foundry, a division unit.

Brown & Sharpe Mfg. Co., Providence, R. I., appointed **Earl P. Leeds** assistant general sales manager in addition to responsibility for milling machine sales; **Alfred W. Sparrow**, director of screw machine sales; **Harold B. Schott**, director of industrial product sales; and **George A. Hawkins**, director of market research and sales promotion.

H. L. Hanks was made purchasing agent of **Ajax Flexible Coupling Co. Inc.**, Westfield, N. Y. He succeeds **F. E. Hapgood**, now production manager.

Myron T. Bennett was made promotional manager, metal industries department, **Diversey Corp.**, Chicago.

C. P. Lavelle was named division manager of **Hygrade Metal Finishing Division**, United States Hoff-

EDWIN H. WEBSTER

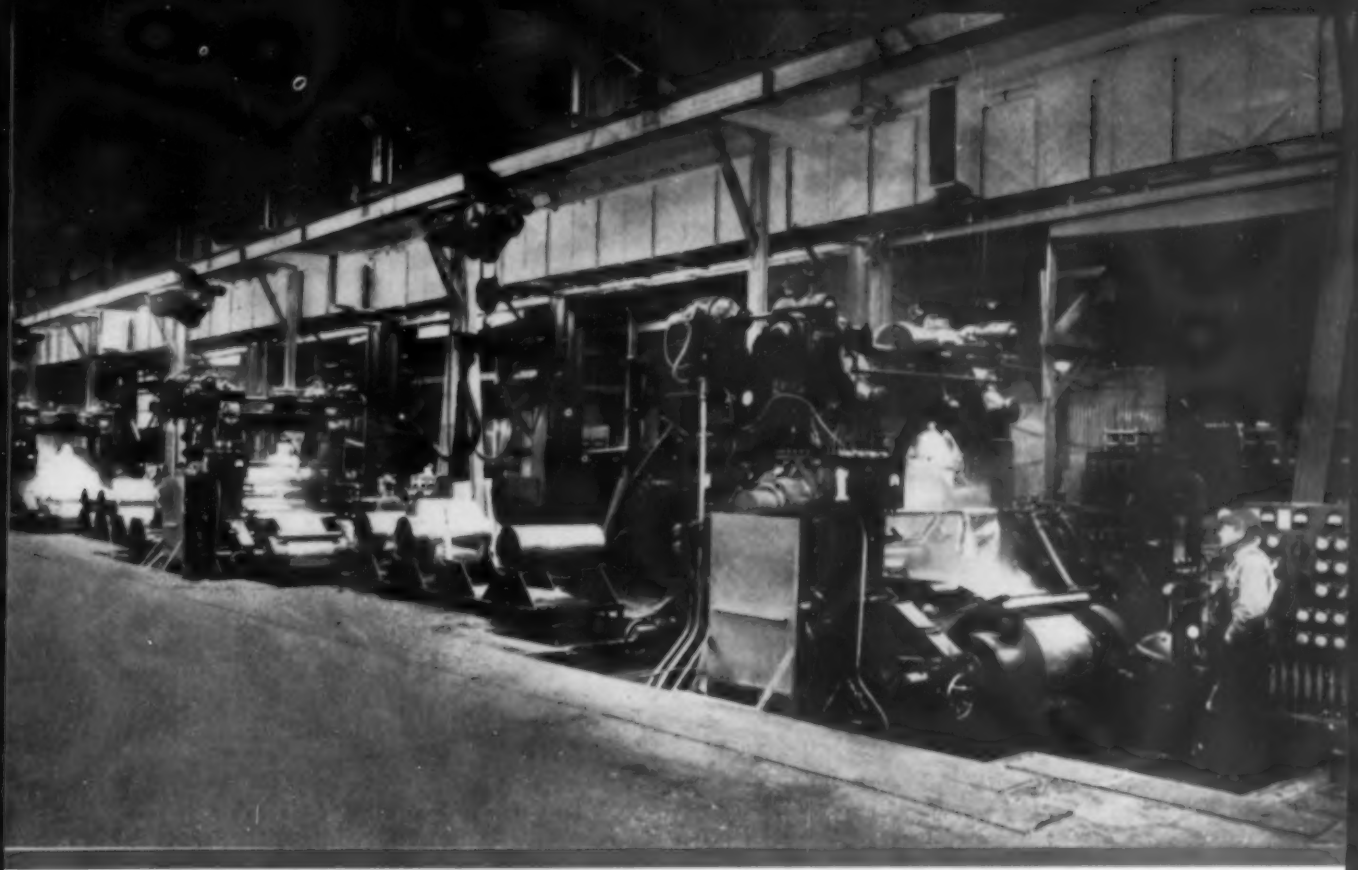
. . . a Luria Engineering v. p.

EDWARD T. McNALLY

. . . president of McNally Pittsburg

C. P. LAVELLE

. . . Hygrade Metal Division mgr.



battery of 9" and 21" x 44" Lewis four-high Foil Mills

. . . high production mills roll foil at speeds up to 4000 fpm

Whether you want to start with an ingot from a hot mill or start with coils, you can get a full range of Lewis equipment, designed and built to meet your specific requirements. Over one hundred modern Lewis Foil Mills, for example, are now successfully operating in plants of the country's top ranking aluminum foil producers.

Built in various sizes and widths to meet individual customer requirements, these Lewis Foil Mills include the latest design in bearings, electric tension control, thermal control and handling equipment. They usually start with .030" or .026" sheet and can reduce down to .00025" . . . at speeds ranging from 1000 to 4000 feet per minute.

So call us in the next time you're in the market for a mill to roll aluminum. Our engineers, who have had extensive experience in the development of high speed mills, will study your requirements with you. This experience plus modern manufacturing facilities will assure you of getting the type of equipment best suited to your specific needs.

LEWIS four-high FOIL MILL

BLAW-KNOX COMPANY • LEWIS MACHINERY DIVISION
PITTSBURGH 30, PA.

BLAW-KNOX

LEWIS PRODUCTS: Two-High Mills • Three-High Mills • Four-High Mills • Strip Mills • Bar, Billet and Structural Mills • Plate Mills • Rod Mills • Coilers • Tables • Shears • Pinion Stands • Gear Drives • Roll Lathes

CMDR. DAVID A. BLACK
. . . joins Flex-I-Line Conveyor

PAUL A. GROBEY
. . . Bryant Chucking eng.-research dir.

KEVIN O'DONNELL
. . . sales position at Steel Improvement

man Machinery Corp., New York. He was formerly plant engineer for the Sikorsky Helicopter Division of United Aircraft Corp.

Cmdr. David A. Black, USNR, ret., was appointed national sales manager for **Flex-I-Line Conveyor Corp.,** Dearborn, Mich.

Carey E. Lindsay was made plant manager of **Niles Fire Brick Co.,** Niles, O., recently purchased by Mexico Refractories Co.

Joseph S. Buchsbaum was made general sales manager, **Standard Transformer Co.,** Warren, O.

H. W. North was made chief engineer of **Dravo Corp.'s** new process equipment department in its engineering works division, Pittsburgh.

John G. Dobson was made vice president, **American District Steam Co.,** and general manager of its plant in North Tonawanda, N. Y.

Robert R. Miller was elected vice president and executive assistant to the president of **Northrop Aircraft Inc.,** Hawthorne, Calif.

Bryant Chucking Grinder Co., Springfield, Vt., appointed **Paul A. Grobey** director of engineering and research. He was director of research.

T. G. McLaughlin was appointed chief engineer of **Avondale Marine Ways Inc.,** New Orleans. He succeeds **Sam P. Stone,** who was promoted to technical assistant to the executive vice president.

Thomas L. Norton joined **Temco Aircraft Corp.,** Dallas, as superintendent of all tooling fabrication. He fills a vacancy created last year by promotion of **Harold B. Ridgley** to chief tool engineer.

Norman N. Breyer joined **Continental Foundry & Machine Co.,** East Chicago, Ind., as metallurgist for its Armor Division.

Clarence J. Sellner was named production manager, **Consolidated Engineering Corp.,** Pasadena, Calif.

Pittsburgh-Des Moines Steel Co., Pittsburgh, appointed **Thomas W. Fauntleroy** assistant general sales manager.

Kevin O'Donnell was made sales manager, turbine and engine products, **Steel Improvement & Forge Co.,** Cleveland. He was assistant to the general sales manager.

C. V. Crockett was made chief engineer at Pontiac, Mich., for **GMC Truck & Coach Division,** General Motors Corp.

Texas Steel Co., Ft. Worth, Tex., elected **George W. Armstrong Jr.** chairman of the board; **W. A. E. Woods,** president; **Malcolm C. Boisselier,** vice president-sales; and **Thurman Killman,** vice president-production.

John C. Merman was made vice president - manufacturing, **Daystrom Electric Corp.,** Philadelphia. **Nelson H. Mageoch** was made vice president-operations at **Daystrom Instrument,** Archbald, Pa., division of Daystrom Inc.

Ralph Michaels, vice president, was elected executive vice president of **Hyman-Michaels Co.,** Chicago.

John G. Buechel was made general sales manager, **Durabla Mfg. Co.,** New York.

OBITUARIES . . .

H. Ward Zimmer, 57, president, **Sylvania Electric Products Inc.,** New York, died Feb. 1.

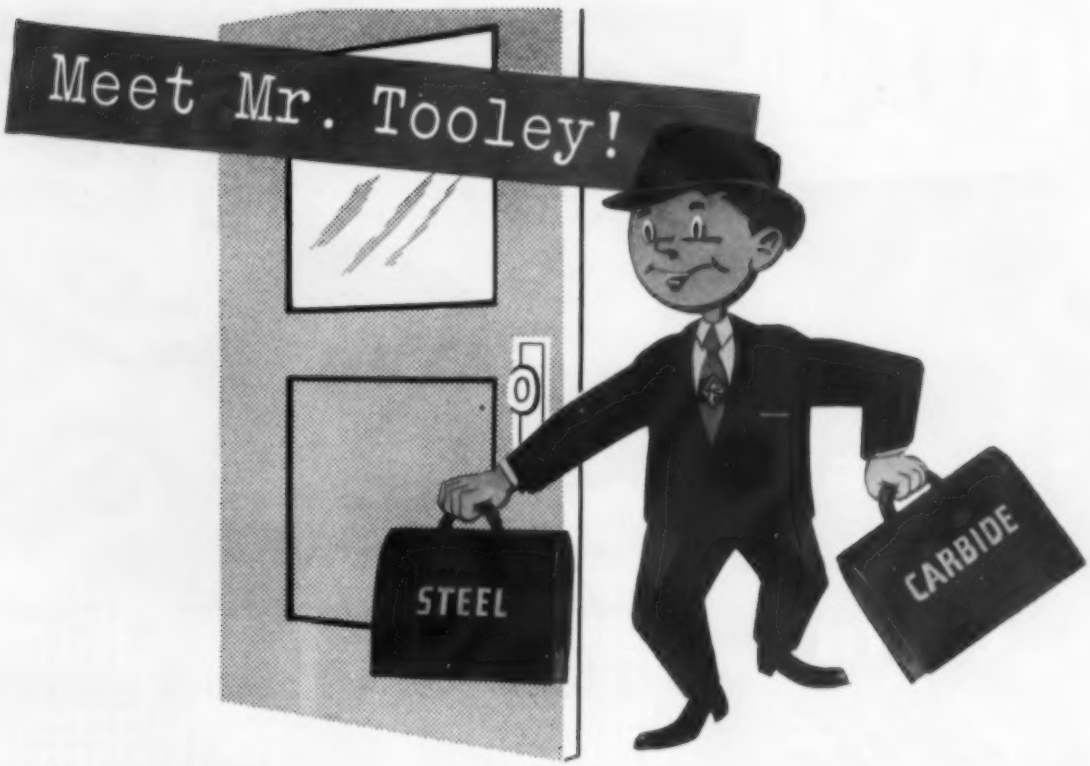
G. Stomps Gauthier, 52, vice president, **Queen City Foundry & Machinery Co.,** Buffalo, died Jan. 31.

Gabriel E. Sundstrom, 78, president, **Sundstrom Pressed Steel Co.,** Chicago, died Jan. 31.

John J. Cadot, 65, since June, 1953, executive vice president, **Hardinge Co. Inc.,** York, Pa., died Jan 19.

Charles E. Hoyt, 85, retired executive vice president, **American Foundrymen's Society,** died Jan. 30 in Oak Park, Ill.

George A. Strom, 66, president, **Strom Steel Ball Co.,** Cicero, Ill., died Feb. 3.



AMERICA is a land of symbols. The things we use and eat and wear, the services rendered to us, are often better known by their symbols than by their generic product names.

From Sunny Jim of yesteryear, who put packaged cereal on America's breakfast table, to Reddy Kilowatt who dramatizes electricity . . . "trade" symbols and characters have become loved and respected as representing reliability, versatility and often uniqueness.

Our Mr. Tooley is such a *symbol* to all industry where tooling for production is so important that it may even mean the difference between profit and loss.

For Mr. Tooley typifies the *unique* position that Firth Sterling occupies among producers of tools and tooling materials . . . that of making and selling *both steels and carbides* . . . the *right* steel or carbide or the exact combination needed to do each job best . . . from a single manufacturing source.

Thus Mr. Tooley has taken his place among American trade characters symbolizing a service of *greater* value built on Firth Sterling's ability to make *unbiased* recommendations and capacity to furnish *complete* shop tooling needs.

Firth Sterling

—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

OFFICES AND WAREHOUSES*: BIRMINGHAM CHICAGO* CLEVELAND DAYTON DETROIT* HARTFORD* HOUSTON LOS ANGELES* NEW YORK PHILADELPHIA PITTSBURGH WASHINGTON WESTFIELD, N.J.

PRODUCTS OF FIRTH-STERLING METALLURGY

High Speed Steels
Tool and Die Steels
Stainless Specialties
High Temperature Alloys
Sintered Tungsten Carbides
High Temperature Cermets
Chromium Carbides
Zirconium
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FREE!
NEW 48-PAGE CATALOG to help you select the RIGHT TOOLS and TOOLING MATERIALS

You'll find this catalog valuable in selecting proper machining materials: carbide standard tools, tips, inserts, blanks; steel toolholder bits, drill rod, ground flat stock. Get your copy from your Firth Sterling distributor or write direct.

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Please send me the new 48-Page Firth Sterling Catalog.
I am particularly interested in: ☐ Steel ☐ Carbide

Name _____
Title _____
Company _____
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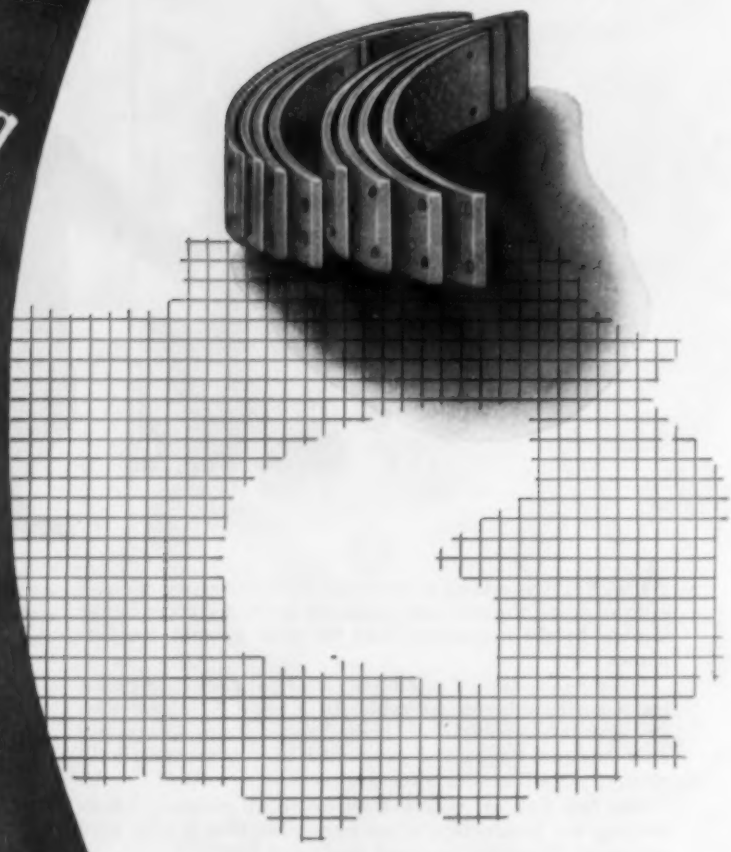
Finding THE RIGHT WIRE CLOTH *to fit* YOUR PRODUCT



Finding the right wire cloth to fit precisely the job it has to do in your product means more than the right type and size of wire, or mesh, or type of weave. It must be right metallurgically—to fit into your fabrication processing. It must be right chemically—to fit, or combat, product-in-use conditions. If it is Reynolds wire cloth it will be *right*—precision processed to your specifications. Details in *Sweet's Product Design File* . . . or consult Reynolds Engineers without cost or obligation.

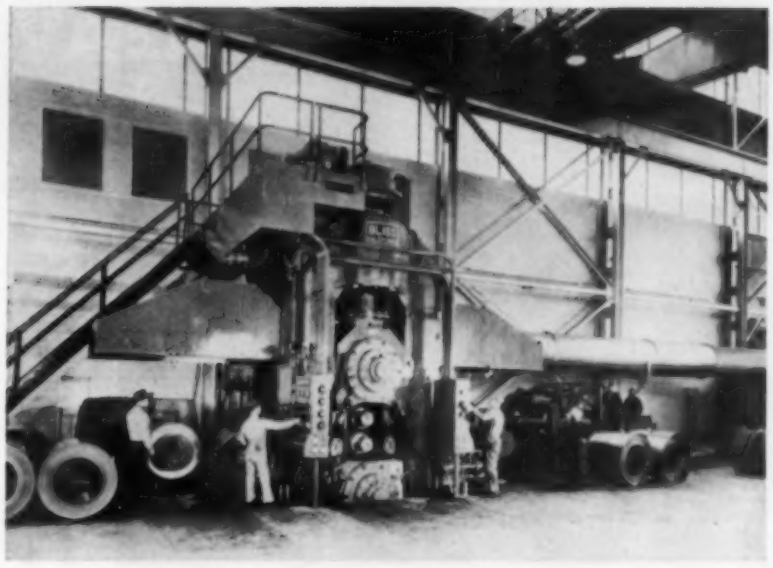
Reynolds WIRE CLOTH for Industry

NS NATIONAL-STANDARD Company NILES, MICHIGAN

REYNOLDS WIRE DIVISION, NATIONAL-STANDARD CO., Box 300, **DIXON, ILL.**

Divisions of National-Standard Co.

ATHENIA STEEL	*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes



Newport Steel's mill goes into production to help satisfy...

Booming Demand for Cold-Rolled Sheets

COLD-ROLLED SHEET users have a new source of supply in Newport Steel Corp.'s reversing cold mill at Newport, Ky. Now formally opened, the mill has been test run since early December.

Output will help alleviate the present stringency in cold-rolled sheets, the tightest of all steel products. Heaviest demand is coming from automotive and household appliance plants. Although producers are operating sheet facilities at full capacity, many are booked through June.

Other producers also are taking action to increase cold-rolled sheets. The Fairless Hills, Pa., producer is increasing its annealing facilities and expects to have more cold-rolled sheet tonnage available by mid-spring.

Newport Steel, which was acquired by Merritt-Chapman & Scott Corp., New York, in March of last year, is one of the few mills in the United States where strip is hot rolled directly from ingot into finished coil in one straight line operation.

Multimillion Dollar Project — The new mill, shown above, is a major item in the firm's $9-million expansion and modernization program. It features a cold reversing 4-high stand which, with strip speeds up to 1700 fpm, can reduce hot-rolled pickled coils to desired gage in coil widths for shearing into flat sheets up to 48 in. wide.

The Newport mill is capable of handling coils weighing up to 40,000 lb, with an inside diameter of 24 in. and an outside diameter of 65 in. When reduced to 0.015 in. in thickness, the coiled strip of steel is about 5800 ft long.

After being cold rolled, the coils go to a continuous flying shear where the steel is uncoiled, flattened and cut to proper lengths and width. Sheets are then annealed in gas-fired, controlled atmosphere furnaces, are temper passed, then packaged for shipment after thorough final inspection for surface finish, gage and size.

Lewis-Shepard Buys Firm

Lewis-Shepard Co., Watertown, Mass., manufacturer of materials handling equipment, purchased United-American Soda Fountain Corp., Watertown, Mass., maker of soda fountains, food service and similar equipment. Included in the metal fabricating equipment are

(*Please turn to page* 65)

Large or small INDUSTRIAL CUT GEARS

- FURNISHED COMPLETE
- CUSTOM CUT FROM YOUR BLANKS
- HEAT-TREATED, CASE OR FLAME-HARDENED

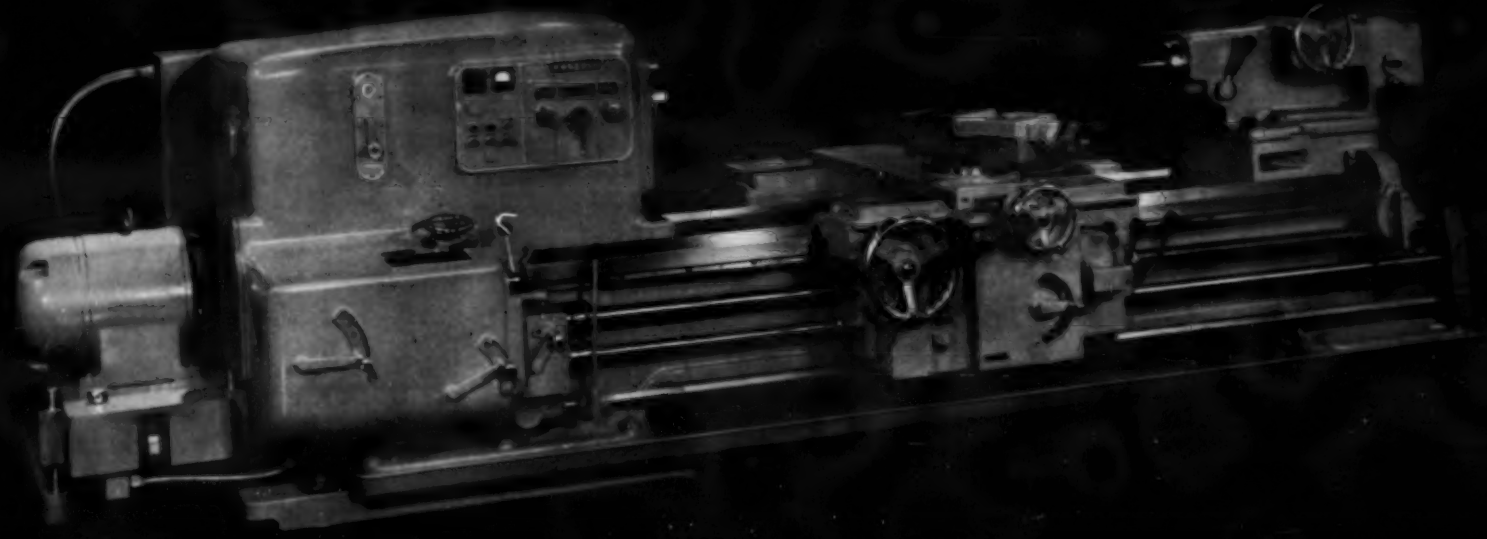
SIMONDS GEAR produces a complete line of industrial cut gears in a full range of sizes from cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite. Also heat-treated, case or flame-hardened carbon or alloy steel. Or, you may have your own gear blanks custom cut to your order. Same quality . . . same prompt service. Send us your requirements for quotation.

ALSO stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

SPUR GEARS • BEVEL GEARS • MITRE GEARS
WORMS • WORM GEARS
RACKS
PINIONS

SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.
LIBERTY at 25TH PITTSBURGH 22, PA.
Quality Gears for over 60 years



THIS NEW MONARCH HEAVY

The MONARCH SERIES 90 DYNA-SHIFT HEAVY DUTY LATHE—Model 2500: Clearance diameter—40"... Swing over cross slide 25". Model 2501: Clearance diameter—44"... Swing over cross slide 31". Model 2502: Clearance diameter—48"... Swing over cross slide 36".

DUTY DYNA-SHIFT

Has a Headstock that Thinks!

Set the Work Diameter Indicator—Get Ideal Spindle R.P.M. in a wink—36 speeds from 6 to 750 R.P.M.

Think you've seen everything in lathes? Take a look! The new Monarch Series 90 Dyna-Shift marks a revolution in lathe design!

Its heart and soul is the exclusive Monarch Dyna-Shift drive headstock. With it any speed change may be made in seconds with it never being necessary for the operator to calculate the spindle speed (R.P.M.) from the work diameter and the desired surface speed (S.F.P.M.). He merely sets the work diameter indicator to the diameter to be turned. In a wink he gets the correct speed automatically, accurately, positively, and this speed is indicated for reference. What's more, with motor capacity equivalent to 60 H.P., this machine has the power to break and the speed to burn any carbide tool. Here's the ultimate proficiency in the use of carbide tooling—and on work of considerable size.

Imagine a machine with all the following advantages. Imagine it in terms of lowered costs! The Series 90 Dyna-Shift:

1. Permits heavy depths of cut to be taken at more than average surface speeds.
2. Allows carbide tooling to be used to its fullest advantage.
3. Shears metal off cleanly at its proper cutting speed and feed.
4. Because it may always be used at its proper cutting speed and feed, it allows the ideal cutting condition of maximum tool life, heavy stock removal and close accuracy.
5. Combines convenience of operation with safety factors which adds to the machine's productiveness and the operator's enthusiasm for the piece of equipment on which he makes his living.

You'll want the full story of this great new lathe—for new it is from end to end! The Dyna-Shift and the many other features are revealed in detail in a complete 24-page illustrated booklet. Fill out the coupon today and let us send it. It's worth getting!—**The Monarch Machine Tool Company, Sidney, Ohio.**

Monarch
TURNING MACHINES

FOR A BETTER TURN . . . TURN THE PAGE 90° —AND LOOK!

THE MONARCH MACHINE TOOL COMPANY, Sidney, Ohio

Gentlemen:

☐ I am interested in your Dyna-Shift story. Please send me your illustrated Booklet #1601 with complete data.

☐ Please have a Monarch sales engineer call on me.

NAME _____ TITLE _____

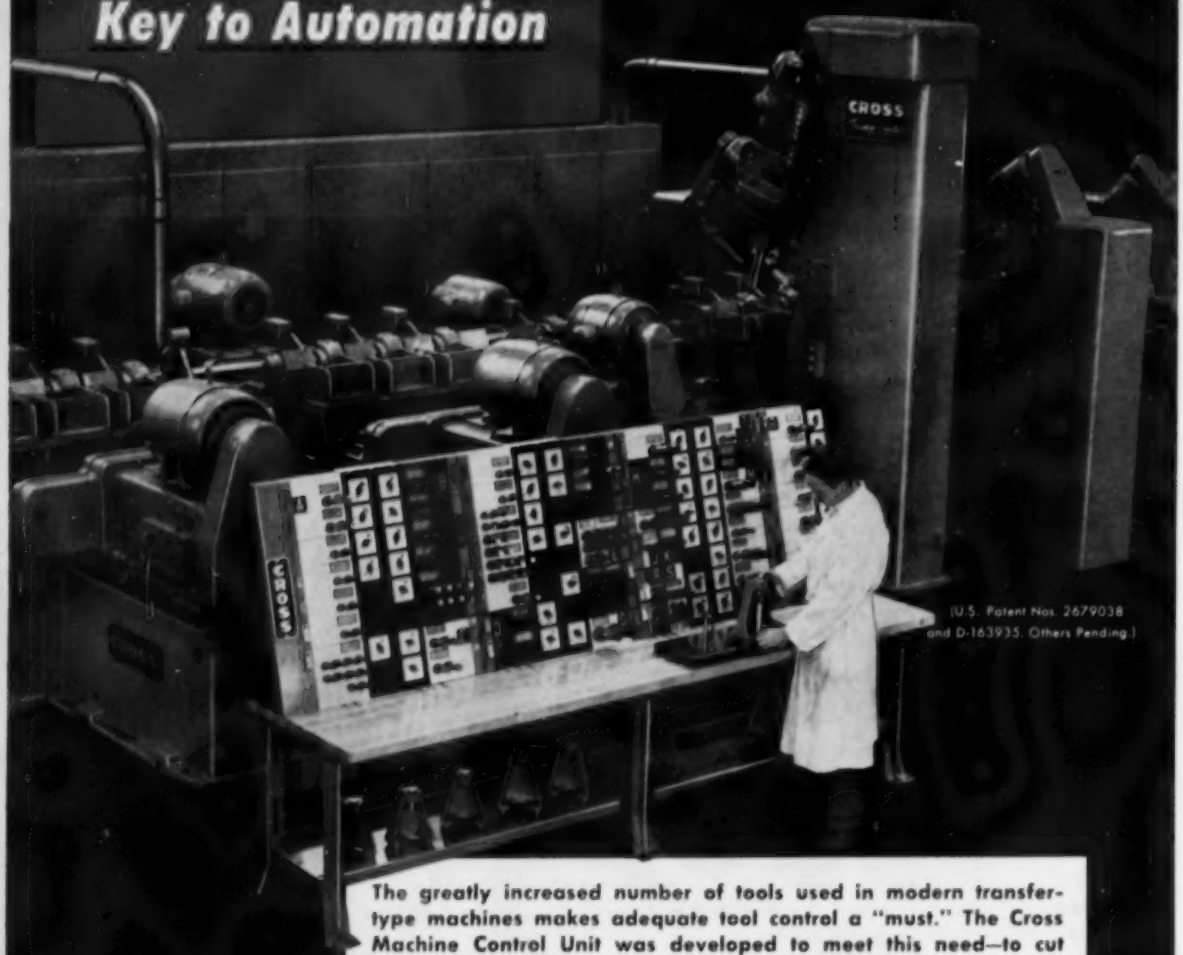
COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Cross Machine Control Unit— Key to Automation

A Mechanical Eye to Watch Your Tools



(U.S. Patent Nos. 2679038 and D-163935. Others Pending.)

The greatly increased number of tools used in modern transfer-type machines makes adequate tool control a "must." The Cross Machine Control Unit was developed to meet this need—to cut downtime by programming tool changes . . . to reduce tool expense.

The Cross Machine Control Unit is equipped with Toolometers which furnish a visual record of used and unused tool life and *automatically stop the machine when tools need changing.* Other tools almost used up are replaced at the same time. This grouping of changes, plus the availability of pre-set tools which are stored in the Machine Control Unit, reduces downtime. And downtime for machine adjustments and trial cuts is eliminated because standard fixtures and gages are provided for pre-setting the tools.

Over 500 Cross Machine Control Units now in use are evidence of cost saving benefits. Get full information today.

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

(*Concluded from page* 61)

press brakes, shears, heliarc welders and chrome-plating tanks.

Chester Firm Buys Dodge Steel

South Chester Tube Co., Chester, Pa., purchased Dodge Steel Co., Tacony, Philadelphia. Dodge Steel, maker of electric furnace steel castings, joins the group which also includes Chester Tidewater Terminal Inc. and Southco Division, South Chester Corp., producer of fasteners and blind rivets. Dodge Steel will be operated as a separate and wholly owned subsidiary.

Machinery Firm Makes Changes

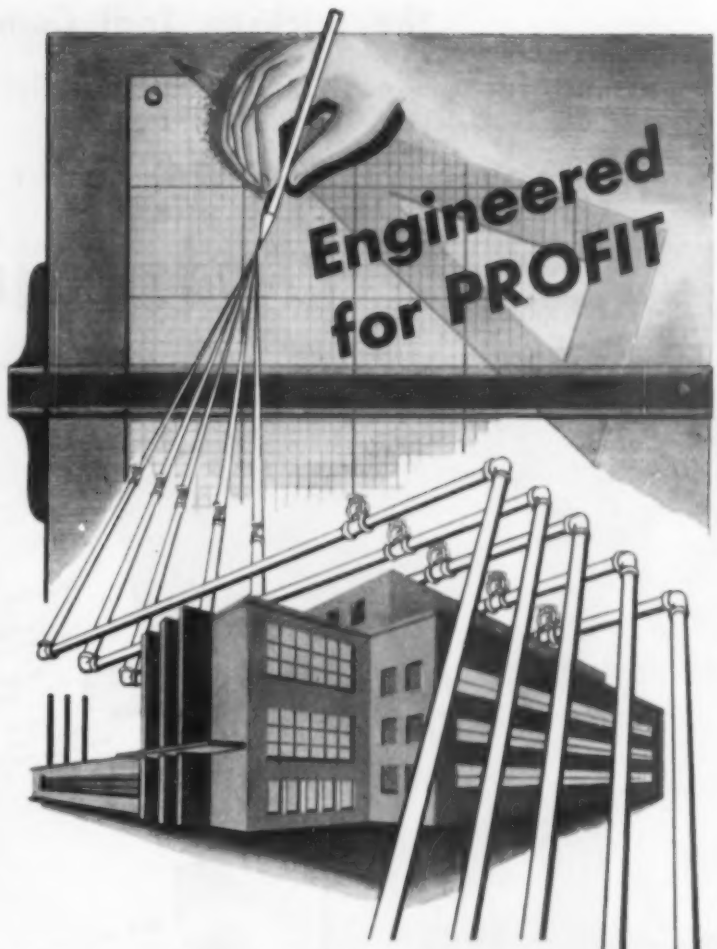
Consolidated Machine Tool Corp., Rochester, N. Y., wholly owned subsidiary of Farrel-Birmingham Co. Inc., Ansonia, Conn., has been dissolved as a separate corporation and is being operated as a division of the parent company. Activities will continue in the Rochester division as before and management will remain the same.

Miller Renames Research Unit

Miller Metal Products Inc., Baltimore, maker of a steel kitchen line, changed the name of its Engineering Research Division to Miller Research Laboratories.

Almond Mfg. Changes Hands

Certain assets of T. R. Almond Mfg. Co., Ashburnham, Mass., have been purchased by a group of businessmen headed by D. M. Pattison, formerly a director and vice president in charge of sales, Warner & Swasey Co., Cleveland. The new enterprise, T. R. Almond Mfg. Co., is chartered as an Ohio corporation, with headquarters in Willoughby, O. The firm will continue to make drill chucks and medium-duty 3-jaw geared scroll and independent lathe chucks. Full production is expected to be reached in March. Works manager is Irving T. Knott. Directors include Mr. Pattison; C. M. French, president, Great Lakes Box Co.; E. B. Gausby, secretary, Warner & Swasey Co.; A. L. Ray, president, Gahr Machine Co., all of Cleveland. S. A. Woleben, vice presi-



If you, like most businessmen, are seeking a steady PROFIT builder for your business, you'll find that ENGINEERED "Automatic" Sprinkler FIRE PROTECTION is the answer.

It's an investment that returns substantial dividends whether you ever have a fire or not.

Let us show you how!

What's worth insuring is worth protecting!

"Automatic" Sprinkler
CORPORATION OF AMERICA
YOUNGSTOWN, OHIO

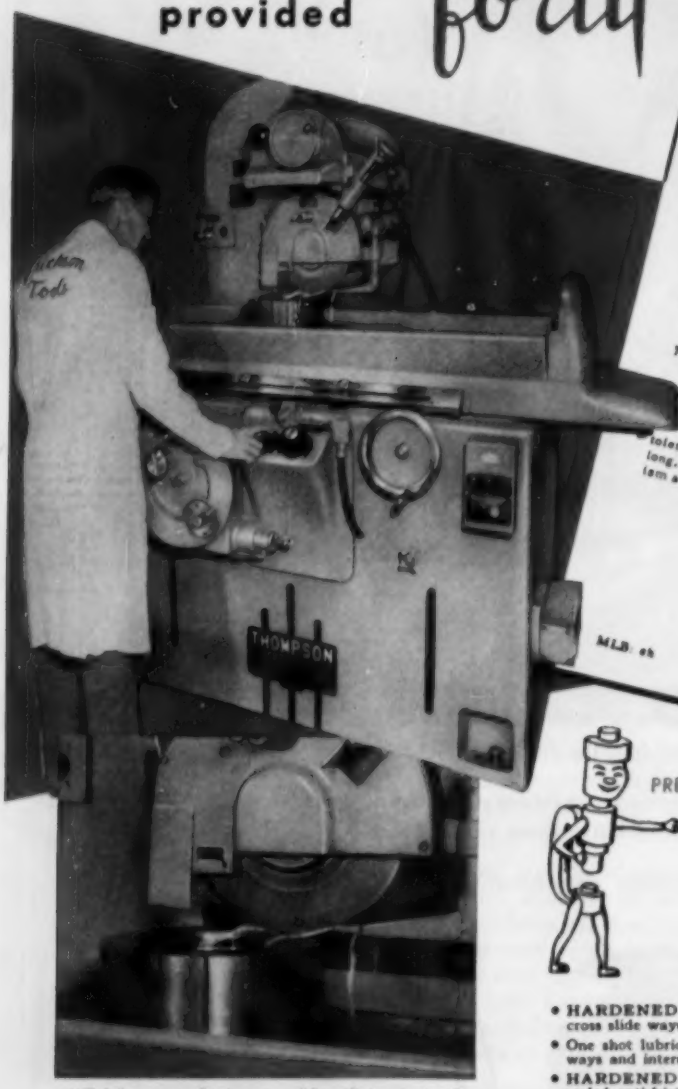
Offices in Principal Cities of North and South America

The Erickson Tool Company

asked for at least .0001 for parallelism and size. . .

The Thompson 2F (8x10x24) Super Precision Grinder

provided "forty millionths"



ERICKSON TOOL COMPANY
EAST 55TH AND HAMILTON AVENUE
CLEVELAND 14, OHIO

September 17, 1954

The Thompson Grinder Company
Springfield, Ohio

Attention: Mr. John Wilson,
Vice President.

Gentlemen:

May we take this opportunity to express our satisfaction with your Thompson 2F 8 x 10 x 24 Surface Grinder.

We purchased this grinder on your claim of .0001 for parallelism size. This tolerance is necessary for most of our work.

Upon its arrival we asked a service man to prove this .0001 tolerance, using 5 blocks on a surface of 4 inches wide by 20 inches long. The test blocks showed .00004 (forty millionths) for parallelism and size. This was well within your guarantee.

Yours truly,

ERICKSON TOOL COMPANY

M. L. Benjamin,
President.

MLB: eh

PRECISION PETE says:

"You may be surprised to find that Thompson 2F Grinders cost less than some others and still provide all these features for greater accuracy and longer service. Fast delivery, too!"

"Erickson products are sold and guaranteed to hold extreme accuracy. It is vital that we have the precision equipment necessary to manufacture these products. Our Thompson 2F Grinder delivers this precision. In the above picture we are grinding a #1200 expanding sleeve and hold within .0001 parallelism and size."

- **HARDENED AND GROUND** cross slide ways completely sealed.
- One shot lubrication to cross slide ways and internal saddle bearings.
- **HARDENED AND GROUND** sealed anti-friction vertical slide.
- **HARDENED AND GROUND BED WAYS** with automatic lubrication.
- 3600/1800 R.P.M. 2 speed wheel head. Heavy alloy steel spindle heat treated, runs in super precision ball bearings accurately preloaded, lifetime lubricated.
- Handy control panel.
- Elevation micrometer stop graduated in .0001"
- GROUND THREAD FEED SCREW.
- Automatic wheel TRUING device.
- Longitudinal hand feed with automatic engagement.
- Hydraulic head movement throttle with rapid traverse.
- Hydraulic table movement throttle.
- Elevating hand wheel graduated in .0005".

Call, write or wire for estimate

Thompson Grinders

THE THOMPSON GRINDER COMPANY · SPRINGFIELD, OHIO

dent of Armstrong-Blum Mfg. Co., Chicago, also is a director.

ASSOCIATIONS

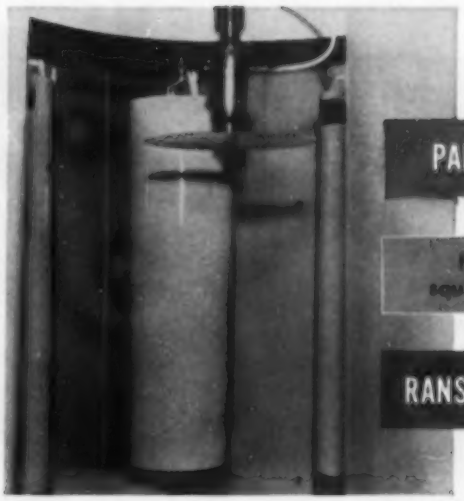
Stewart Joseph Cort, vice president, Steel Division, Bethlehem Steel Co., and a director of Bethlehem Steel Corp., is the first to win the Benjamin F. Fairless Award of the **American Institute of Mining & Metallurgical Engineers Inc.**, New York. Presentation will be made at the annual banquet of AIME on Feb. 16 at the Conrad Hilton Hotel, Chicago. The citation will commend Mr. Cort "for his leadership in iron and steel manufacturing which has made his company an outstanding producer in the industry." The award honors Mr. Fairless, chairman, U. S. Steel Corp., for his intense interest in the technology and development of the iron and steel industry.

STEWART JOSEPH CORT
. . . Bethlehem Steel v.p.

NEW ADDRESSES

Vanton Pump & Equipment Corp. moved its executive and sales offices to its plant at 201 Sweetland Ave., Hillside, N. J.

Samuel C. Rogers & Co. Inc., Buffalo, manufacturer of grinders,



● When General Water Heater Corp., in Burbank, Calif., switched from hand spray to Ransburg No. 2 Process in painting water heater jackets, paint mileage increased almost 65%. Where General formerly got 370 square feet per gallon of paint, they now get over 610 per gallon.

On this installation, units ranging from 20 to 100-gallon size are painted with Ransburg No. 2 Process reciprocating disc atomizer. Changes in jacket sizes can be made without stopping the conveyor. With the reciprocating disc atomizer, change in stroke length is made "on the fly" without shutting down production. General also paints smaller parts, such as heater tops, bottoms, doors and legs, with the Ransburg equipment.

In addition to paint and labor savings, General Water Heater is getting "excellent consistency" and a high quality finish on their products. Another on-the-job-example of the unmatched efficiencies of the Ransburg No. 2 Process of electrostatic spray painting!

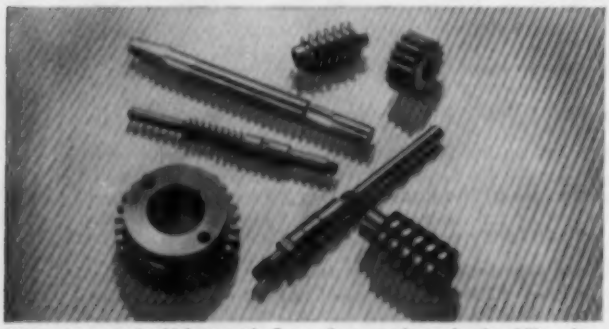
Ransburg maintains complete laboratory facilities for test-painting YOUR products under simulated production conditions. Why not let us show you what Ransburg Electrostatic Processes can do for you in YOUR finishing department. No obligation.

For further information about Electrostatic Painting Processes and complete Ransburg services, write Dept. S

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

Minneapolis-Moline reduces costs 40% with Republic Cold Drawn Steels!

Here's a new Republic product for mass producing certain parts faster, more uniformly and at less cost—Republic Iron Powder. It is ideal for fabricating complicated shapes which are difficult to produce economically by other means. Republic metallurgists can help you determine iron powder's suitability to your parts. Or, they will suggest alternate methods or materials better suited to your operation.



When parts require high strength, fine surface, toughness, hardenability, close tolerance or accuracy of section, you get them all in Republic Cold Drawn Alloy Steels—plus UNIFORM MACHINABILITY. Your high-speed automatics can take full advantage of these cost-cutting qualities. Designers can make full use of the high strength and uniform structure produced by cold drawing. Production men get the ideal combination of wearability and strength from the uniform hardenability and toughness of alloy steel.

The power-takeoff shafts on the self-propelled Minneapolis-Moline Harvestor carry a heavy load. Requirements called for a minimum-yield strength of 100,000 p.s.i. It was necessary that these shafts consistently meet minimum requirements in order to eliminate or to minimize failure in service.

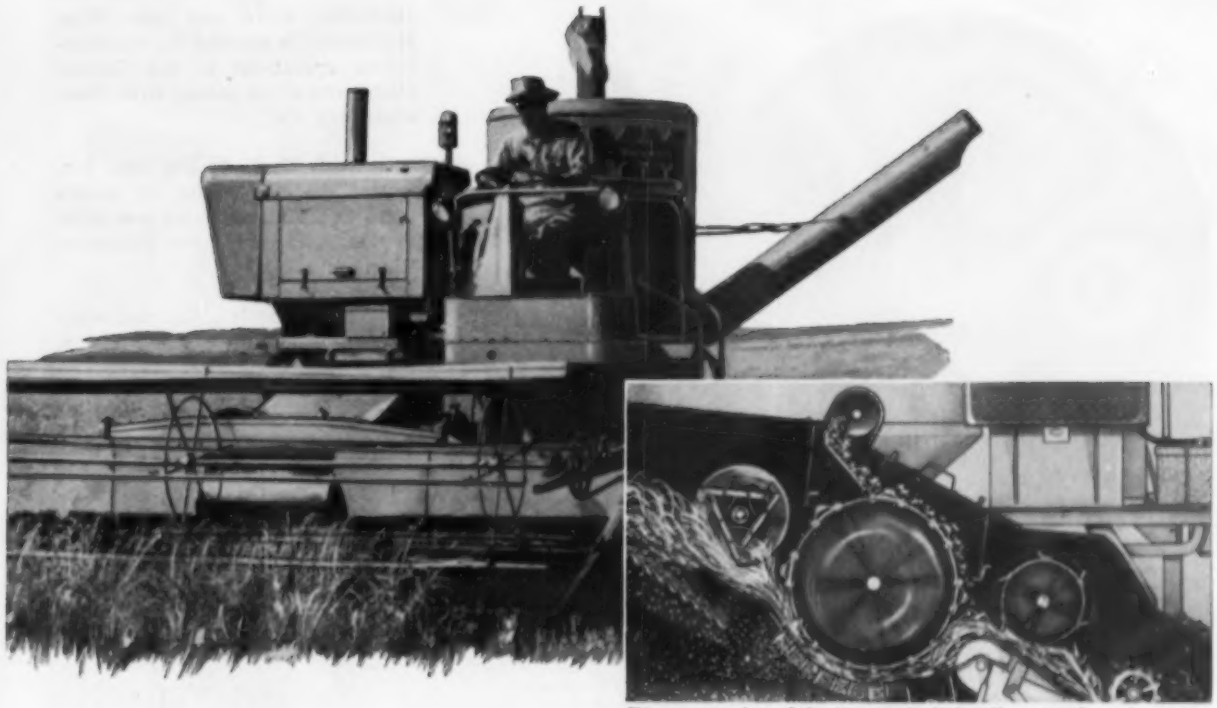
In addition, material that had to be stress-relieved, straightened and precision-ground was expensive.

Republic's Field Service Specialists were invited to work on this problem with Minneapolis-Moline Engineers. The solution was a switch to Republic C-1050 Cold Drawn Steel.

Now, the company is getting the proper physicals needed to do the job. And, costs

REPUBLIC

World's Widest Range of Standard

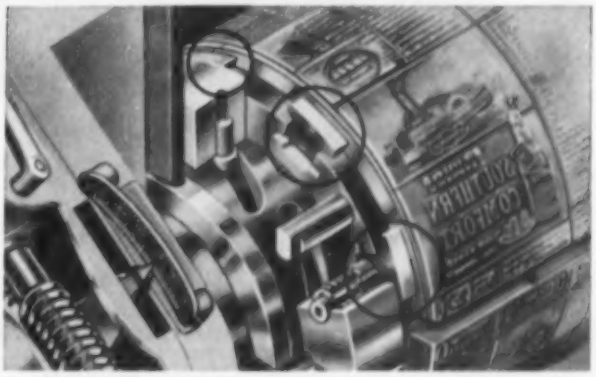


This cutaway view of the Minneapolis-Moline Harvestor shows the power-takeoff shafts made from Republic Cold Drawn Steel.

have been reduced approximately 35 to 40% since the switch to Republic C-1050 Cold Drawn. They buy the shafting in four-foot lengths. The only finishing operations necessary are: threading the ends, key-seating the shaft, and centerless grinding the bearing areas to close tolerances.

Naturally, not all cold finished steel requirements are the same. To make sure that you get the most out of the Republic Cold Drawn Steels you buy, Republic provides a full-time field service staffed by expert metallurgists and machining specialists. They will visit your plant, work with your staff on solving cost and production problems.

Call your nearby Republic sales office for the facts. Or mail the coupon.



Steel parts, like these printing-plate clip bars, are made at a great saving from Republic Special Sections. The bars are cold drawn to predominating cross section of the part. Cold drawing gives your steel parts higher strength, greater hardness and a bright smooth finish. Cutting to length and drilling are often the only operations necessary to finish the part. Sections can be produced in a wide variety of analyses with contour variation almost limitless.

STEEL

Steels and Steel Products

REPUBLIC STEEL CORPORATION
3120 East 45th Street
Cleveland 27, Ohio

REPUBLIC STEEL

Please send literature on:

☐ Cold Drawn Steels ☐ Special Sections ☐ Iron Powder

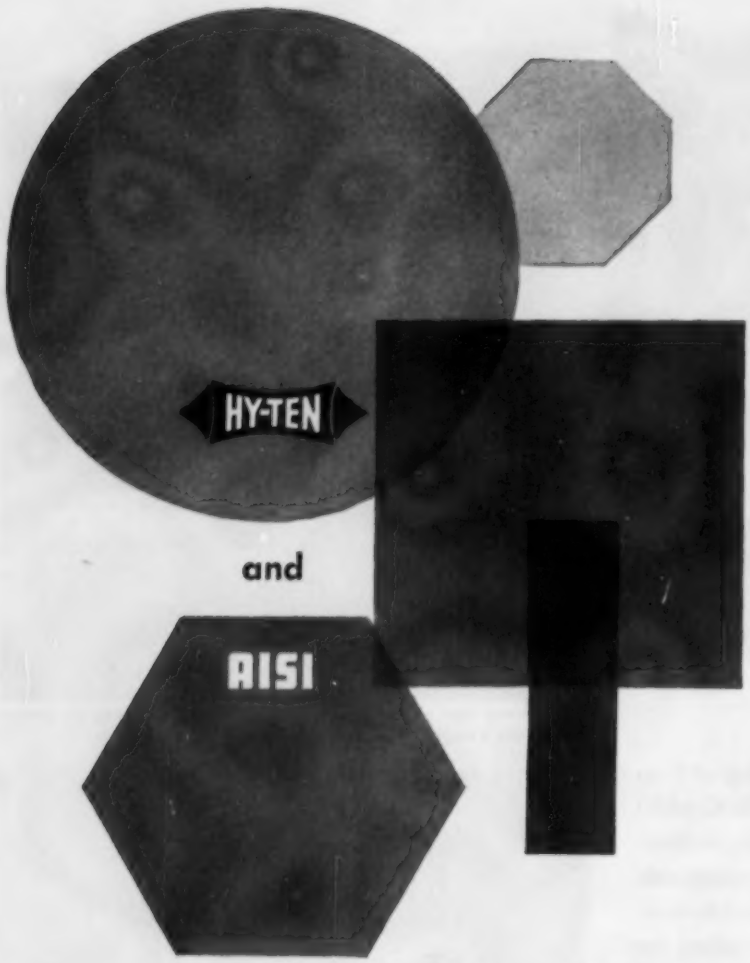
Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

E-1097



bars, billets and forgings
in sizes, shapes and treatments for every need!

Wheelock, Lovejoy & Company, Inc., can fill your alloy steel requirements promptly. This applies to both standard AISI and SAE steels and to our own HY-TEN steels—"the standard steels of tomorrow". Take advantage of our seven strategically located warehouses. All of them can supply these steels in the form and quantity you need. Every warehouse, too, is staffed with expert metallurgists who are ready to serve you.

Write today for your FREE copies of Wheelock, Lovejoy Data Sheets. They contain complete technical information on grades, applications, physical properties, tests, heat treating, etc.

near you . . .

Warehouse Service—Cambridge • Cleveland • Chicago
Hillside, N. J. • Detroit • Buffalo • Cincinnati
In Canada—Sanderson-Newbould, Ltd., Montreal and Toronto

WHEELOCK, LOVEJOY & COMPANY, INC.
131 Sidney Street, Cambridge 39, Mass.

automatic knife and saw filing machinery, is moving its manufacturing operations to Big Rapids, Mich., site of its parent firm, Hanchett Mfg. Co.

Central Tool & Die Co. Inc. moved its offices and all manufacturing facilities to its new plant at 690 Maple Rd., Troy township, Birmingham, Mich.

Age Engineering Co., manufacturer of molds for plastic injection, compression, transfer molding and die casting, moved to enlarged factory offices at 4030 Gage Ave., Los Angeles.

Binks Mfg. Co., Chicago, manufacturer of spray painting equipment, moved its Seattle branch office to 514 Denny Way. The office is managed by J. C. Level.

REPRESENTATIVES

Enthone Inc., New Haven, Conn., maker of metal finishing and electroplating chemical products, extended the territory of its representative, Ardco Inc., to include southern Illinois and eastern Missouri (not eastern Michigan as previously announced by the company).

Reynolds Metals Co., Louisville, appointed Milward Alloys Inc., Lockport, N. Y., distributor of its aluminum pig and ingot.

Winslow Co., Newark, N. J., maker of electrical instruments and test equipment, appointed A. W. Nash Co., Los Angeles, as its sales representative.

R. P. Adams Co. Inc., Buffalo, maker of industrial filtration equipment, swimming pool filters, compressed gas heat exchangers and filters, appointed Ross Engineering Co., Chicago, and A. N. Dunn, South Bend, Ind., as its representatives.

Electro-Glo Co., Chicago, appointed LaSalco Inc., St. Louis, manufacturer of equipment for the electroplating and polishing field, as a distributor for Electro-Glo electropolishing concentrates.

Announcing the Clark-Ross Y-200

Designed specifically for 20,000 lb. jobs!

CHECK THESE FEATURES:

Heaviest uprights in the industry: Hi-tensile steel channel specially rolled for this truck.

Shortest turning radius: 15 feet; shorter than any other comparable truck.

3 in. thick steel steer axle.

10 in. underclearance at uprights, plus excellent weight distribution, permit operations under most severe yard conditions.

Safety check-valve built-in: a Clark-Ross exclusive; impossible to drop the load because of line failure.

Planetary gear drive: takes the strain off the axle; all drive components protected.

Extremely easy to service: hydraulic cylinder serviced from bottom, no need to remove uprights; engine and hydraulic system easily accessible.

From the ground up, the Y-200 is a genuine 20,000 lb. truck—not merely a beefed-up truck of less capacity. Pre-production models have been job-tested for nearly a year at steel mills, sawmills and wood treating yard.* These trucks have proved their ability to cut handling costs under the toughest conditions. We are frank to say that we believe the Y-200 will give you better performance, at less cost, than any comparable machine. We invite your comparison: Simply call your local Clark dealer, listed under "Trucks Industrial." Or write us direct. There's no obligation.

*Names supplied on request.

CLARK EQUIPMENT

ROSS CARRIER LINE
Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 26, Michigan
☐ Send details on Y-200

Name_____
Firm_____
Address_____
City_____ Zone____ State_____

DON'T GAMBLE *on*
getting the **RIGHT** *bolts*

The NEW Buffalo Bolt service organization is at *your service* to make sure that you get the fasteners you need when you need them. Whether you order direct or through a Circle (B) distributor.

Offering the finest and fastest service in the industry, key personnel—in the field, district offices and factory—give immediate, accurate information on prices, delivery and other pertinent data.

See for yourself on your next order.
Ask for Circle (B).

WESTERN OFFICE
Chicago
HArrison 7-2179

EASTERN OFFICE
New York City
REctor 2-1888

CENTRAL OFFICE
North Tonawanda
JAckson 2400 (Buffalo)

BUFFALO BOLT COMPANY
Division of Buffalo-Eclipse Corporation
NORTH TONAWANDA, N. Y.
Making both FASTENERS & FRIENDS for 100 years

1

STEEL's 1955 Management Series . . .

The editors of STEEL herewith present the first in their ten-part series, Program for Management for 1955. The complete list:

1. **Product Promotion** (Feb. 14)
2. **Budgeting for Cost-Cutting** (Mar. 14)
3. **Plant Layout** (Apr. 18)
4. **Communications** (May 16)
5. **When To Re-equip** (June 20)
6. **Put Business Trends To Work** (July 18)
7. **Consultants** (Aug. 15)
8. **Purchase Analysis** (Sept. 19)
9. **Market Facts** (Oct. 17)
10. **Keep Your Product Growing** (Nov. 14)

CAN YOU ANSWER THESE QUESTIONS?

1. Can product promotion help salesmen?
2. Does product promotion make sales?
3. Will product promotion pay?
4. Can you measure its results in sales?

(answers on page 80)

Product Communication . . .

paves way for greater sales

"AMERICAN MOTORS will get a larger share of the automobile business in 1955 than in 1954. We are not asking for help from Congress or the Federal Trade Commission or the antitrust people at the Department of Justice. We believe we can do it on our own . . ."

Would you like to attribute that degree of self-help to the sales destiny of your company? Would you like to assign that degree of certainty to your sales promotion program?

You can. The man who spoke those words of conviction, George Romney, the president of American Motors Corp., doesn't have a guaranteed crystal ball. He has the obvious in mind, but he has the faculty of vocalizing the obvious at the appropriate moment.

The Secret—Mr. Romney is sure his company can meet the challenge "by doing a more effective merchandising and selling job (and) by *articulating* what we have to sell better than in the past."

"Sales articulation" is Mr. Romney's way of characterizing the inseparable link between direct sales and product promotion. Hudson and Nash always have been good products, he explains, "but we have done a terrible job of letting the public know about it."

Mr. Romney isn't alone in his estimate of the importance of "letting the public know about it" through the media of product communication — catalogs, direct mail, radio, television, publication advertising, trade shows, public

Plant identification . . .

While riding in a car or train have you ever passed an attractive industrial plant and wondered: Who are they? What do they make?

You're missing a rare opportunity to tell the public these things if your plant is not properly identified.

There are incidental benefits, too: You have an added incentive to keep your plant in good repair. Foreboding, littered grounds usually give way to the manicured atmosphere of a park. Result: You make a better impression.

relations, trademarks, etc. The nation's product communication budget and the value placed on all passenger cars shipped by the auto industry last year ran neck and neck. Both figures bulked well over the $8-billion mark!

Question—With this kind of money being spent "to tell the public about it," metalworking management is asking: How can we get maximum mileage out of our product communication dollar?

To get an informed answer, STEEL talked to advertising and sales executives in a number of metalworking companies which are doing an outstanding product communication job. Leading authorities in the field of industrial advertising also were interviewed. This is what we found:

Answer — Progressive management is going to the grass roots of product communication, taking a fresh look at what it is, how it operates, what it can do. The exact role of each instrument of product communication is being defined.

Concepts that were "blue sky" yesterday are being accepted today. Production, sales and product communication are being viewed as integrated rather than separate functions. Product communication budgets are being based on integrated objectives rather than an arbitrary per cent of sales. More realistic ways of measuring product communication results are taking hold.

Where do you start this self-appraisal? Taking first things first, you can ask . . .

What Is It?

Sales Information—A chief engineer heard of a special machine through a friend at a technical meeting. Going to the vice president in charge of production, he recommended that they take a look at it.

"I've never heard of the company," were the veep's first words. "Their salesmen have never been around. What is their line? What is their reputation?" After checking his favorite business papers, he added: "And they don't advertise either."

The company did purchase the machine, but it wasn't until some time later when the vice president happened to see it in action at a trade show and had the opportunity to sound out the company's sales representatives.

Crow About It—The moral is obvious. Direct selling alone is like keeping a secret. You tell one person at a time. Product communication talks to the mass audience.

Properly aimed, it reaches all

your customers and potential customers.

It not only talks to the vast number of men who buy your kind of product but also to the even greater number who influence its purchase.

Message—Call it customer education. Your curriculum must drive home three points: Who you are, what you make, what your reputation is.

It sounds simple, but how many of your customers and potential customers can answer the three questions?

How It Operates

Opens Doors—Unless you sell supplies or standards that do not require engineering application, you can't count on product communication to make too many actual sales. Substantial expenditures call for studied purchases. Product communication does its job by paving the way for your salesmen.

It reaches the men who buy and those who influence purchases. A study by U. S. Steel Corp., shows that 1850 men in 33 customer plants influence purchases. An additional 105 men are buyers. U. S. Steel salesmen see only the latter. With the exception of two buyers, *all* read business publications in which U. S. Steel advertises.

There is always the question: Who are the key men to contact? One man puts it this way: ". . . it is particularly difficult to pinpoint all the men who influence the purchase of equipment. Our market research reveals as many as 34 men in one company have direct or indirect influence in buying important equipment. It indeed would be difficult for a salesman to cultivate all 34."

Most salesmen agree. Koppers Co. Inc. asked its sales force: 1. Do you consider your company's advertising an important tool in helping you make sales? (115 of 121 salesmen said YES.) 2. Do you feel you could do as good a sales job if your company did not advertise? (113 said NO.) 3. On making first calls do you find the prospect is familiar with the company because of its advertising? (81 salesmen said OFTEN; 46 said SOMETIMES; no salesman reported a prospect who had NEVER heard of Koppers.)

Why is it important for people to know who you are, what you make, what your reputation is?

Time Lag—You buy a tube of tooth paste on impulse. Most industrial sales must wait for a need or the creation of one. If your product has a life expectancy of 10 or 20 years (barring obsolescence), it's a long time between needs. In the interim, you must condition your prospects through constant product communication.

"If you analyze the motivation behind most industrial purchases," says an industrial advertising authority, "you'll find it is the result of an *accumulation* of impressions. It is impossible to pin it down to this ad or that sales call."

Of course, many products and supplies are standards. One brand doesn't have a price or quality advantage over the other. Sales generally are traced to good service and personal relations. Here product communication can help to get the customer to think well of your company and accept your brand.

No doubt about it, product communication gets into intangibles, but you can prove . . .

What It Can Do

Many Things—Durez Plastics & Chemicals Inc. used product communication to invade a new field. The company's advertising manager says the foundryman who didn't know his firm existed eight years ago is probably a customer today.

Jarecki Machine & Tool Co. was selling all it could produce in 1953, but it launched a national advertising campaign in business publications to build up a backlog of customers.

The same year the National Electrical Contractors Association saw the end of the defense construction boom and allocated $500,000 for a "business development program" to smooth out the industry's traditional feast and famine cycle.

Cheaper — Product communication reduces the cost of making sales. In a 1953 survey of firms selling to product design, plant engineering and metalworking markets, the Sales Executive Club of New York deduced from 228 returns:

The average cost of a sales call was $17.24. Out of every 100 cold calls an average of 9.2 orders were written. The number of orders jumped to 16 when salesmen were following up publica-

KEARNEY & TRECKER
MILWAUKEE

What's in a name? . . .

The unique function of a trademark goes into semantics. The product and the company become synonymous. Instead of saying "that machine," you say "that Kearney & Trecker."

Because trademarks are a constant reminder of your company, many firms do not put them on inferior products. They make "untried" products earn them.

Your trademark should be easy to read and big enough to be read at a reasonable distance.

Catalog in three dimensions . . .

This manufacturer dramatizes his product by showing the customer and potential customer how it can be used. Similar "pages" from the catalog cover other fastener lines.

Another manufacturer puts the pictures of its salesmen in its catalogs. When a prospect requests literature on a certain line, he not only gets the information but also the pictures and names of the men who sell it.

Is there an authoritative reference book on your product? Another company plans to make a name for itself by preparing the first one in its field.

tion advertising inquiries. In terms of cost per order, this was the breakdown: Cold calls, $187.39; advertising inquiry followups, $107.75.

Gets Around — The head of a successful company (call it company A) tells about the time it was negotiating a long-term loan, which was to be handled through the issuance of debentures. At the same time, its bank was arranging a similar loan to a much larger company (call it company B) in the same area.

Company B was charged 0.25 per cent more interest than company A, which regularly used advertising for many years to advise industry and the public of its facilities.

When the president of company B complained to his banker, he was told that his company was not so well known as company A; that the market for his company's securities was not so broad as company A's.

Proving Ground—Product communication speeds sales. In the acceleration process you'll also get a good idea of how your product will be accepted by the market over the long pull. One vice president in charge of merchandising puts it this way:

"In the long run no product sells because of advertising that would not have sold without it. If the product is not worthy, advertising simply hastens the day when the whole market has sampled and rejected it. Advertising cannot make a permanent success of any product not fit for success of its own."

This vice president views product communication as a phase of market research. The point: Your product must have a need or desire value; it must have a market or a potential market; it must be competitively priced. Unless these qualifications are filled, you probably haven't got a job for product communication to do.

Economics—Have you ever considered the consequences of dropping your product communication efforts?

A survey of 696 industrial companies showed: 220 said there would be an immediate drop in sales if business paper advertising alone were cut. Predictions ranged from an estimated 5 per cent decrease in sales to "it would put us out of business." A qualified or eventual drop in sales was indicated by 177 respondents. And 166 said they would need a larger sales force or would find difficulty entering new markets.

Over-all Economy—Some people go farther. In late 1953, this editorial appeared in *Printers Ink*. It said in part:

"We are not among those who believe that our economy needs the prop of heavy expenditures for national defense or war to keep it strong.

"We are among those who believe that advertising has the power—if management will use it—to offset any decline in defense spending that may be in sight.

"Today, some of our major industries are running into their first real sales problems since World War II. We believe that in most cases they will be able to lick those problems by increasing or at least maintaining their advertising."

Indications are that they did. But the question remains: How can you be sure you are getting . . .

Your Money's Worth

Facts of Life — Product communication pays—if you know how to use it.

Say you are the proud manufacturer of machinery which

makes the only left-handed widget in captivity. You call in advertising: "I'm giving you $500,000 to push this baby. Get a spot on Garroway's morning TV show. Get a spread in the *Post*."

If advertising is worth its salt, it will dig up some facts of business life before spending a cent: Does industry need the machine? Is there a potential market? How big is it? Where is it? Is the price right? Who are the people we want to talk to? Which media of product communication will reach them most efficiently?

Report—If the machine has only 53 potential customers, you won't get much of a return by telling housewives and preschool children about it on Garroway's morning show. The *Post* is a fine magazine, but how many of its readers *aren't* interested in the widget machine?

In this case, specialized business publication advertising is the logical choice. Remember the findings of the U. S. Steel survey? Your advertising finds and influences all the men who may have a part in buying your machines —even if you don't know them.

The Point—Generally speaking, the nature of your product determines the scope of your audience, which breaks down into customers, potential customers, buyers, those who influence purchases.

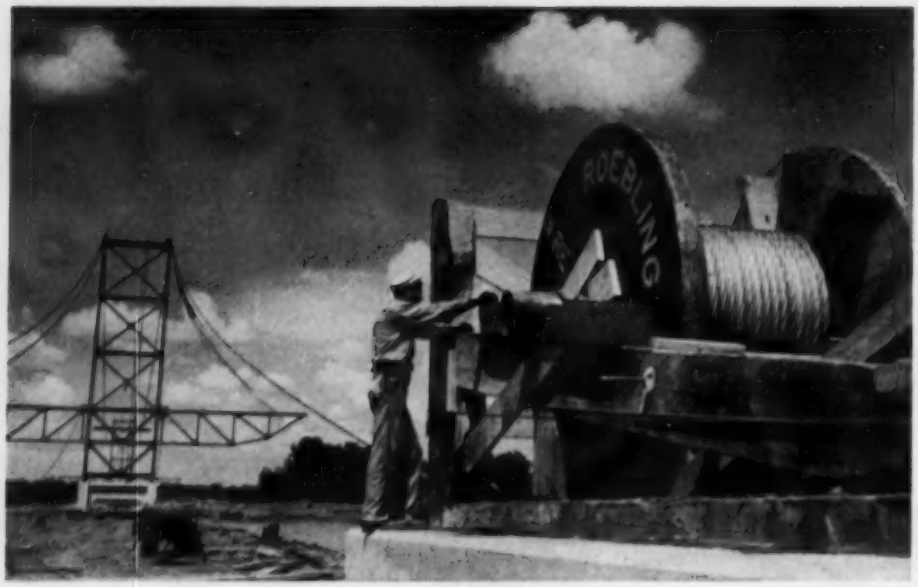
The question becomes: Which men do you want to reach? Certainly, you won't catch the eye of top brass with a catalog containing information for purchasing agents. Conversely, your four-color ad proclaiming that the widget machine does it better, faster, cheaper doesn't contain the details the engineer wants when he is shopping for a machine to do a specific job.

Or, if you want to converse with top brass and purchasing agents at the same time use the media that reaches both.

Before you can use them effectively, it is important to know . . .

How They Serve Catalogs

Silent Salesmen—A good catalog is generally regarded as the equivalent of a run-of-the-mill



salesman. It contains all the facts: Specifications, dimensions, weights, applications, prices, etc. Further, when the catalog is opened, the customer is in a buying mood. The need is there. He is comparing brands, prices, delivery dates, etc. It is at this point that the good salesman can step in and convince your customer that your product can do it better, faster, cheaper.

Most catalogs reach the men at the production and engineering levels. Many companies also use special-purpose catalogs — books, bulletins, brochures, etc. Say you are a supplier many steps remote from the ultimate use of your product. It may pay to promote end use through a how-to handbook.

Living case histories . . .

What more could you ask? Here the customer and potential customer see your product in action.

What are the possibilities?

Say you stencil your company's name on a shipment crossing the country on a flatcar. The tracks, more than likely, run parallel to heavily traveled highways. Many motorists will be exposed to your message. You'll get more eye traffic at the outskirts of metropolitan areas where motorists must wait for trains to pass at grade crossings. Upon arrival at the customer's city, many more persons will see your name during switching operations.

Of course, a lot of this "circulation" won't be of direct benefit, but if just a few of the right people see your message, your stencils have more than paid for themselves. Certainly, it is much more reasonable than spending a lot of time and money making a product and then wrapping it in a piece of newspaper.

Direct Mail

The Rifle—The "personal message to the exact man you want to talk to" is doing a good job for a lot of people. But there is some question whether it will sell a $98,000 machine. As one man puts it: "That kind of customer needs a lot of lovin'. I rate the value of the medium in direct proportion to the price of the product and the degree to which it is a standard."

Other people say: "Direct mail is no better than your mailing list." Then they add: "The next problem is to get by the man's secretary. She generally has authority to screen his mail; 80 to 85 per cent of it winds up in the wastebasket before it gets to him." To get by the secretary or get to "the man," some people use "substantial-looking" house organs as direct mail pieces.

Time

Radio-TV — These instruments of wholesale telling come at premium prices. Both do yeoman's work for consumer items, but a lot of industrial companies say: "We've thought of using them at one time or another, but we can't afford this luxury until we have licked the day-to-day problems of doing business."

Notable exceptions: Local radio and TV have been used to recruit skilled employees when the labor supply is short. On the rare occasion, a company going into a new city may sponsor a local radio

or TV show to "get acquainted" with the community.

Space

The Big Plus — Subtle psychology plays an unseen but powerful hand in publication advertising. The editorial acceptance of the publication is transferred to your product. Editorial content determines the publication's audience. The quality of its circulation—the men it reaches—determines how well the audience is covered.

Most people use the over-all approach, choosing the paper with the "best" reputation that talks to the greatest number of customers and potential customers. People who can afford it often combine their efforts, aiming at the big audience in some publications, sniping at special groups in others. Everybody says: "You must advertise with regularity on a continuous basis to get your money's worth."

Trade Shows

The Big Look—This is the one time the men who buy and those who influence purchases come to you. You are generally previewed by an executive who is on the make for ideas. If what he sees, touches and hears hits a responsive note, he will send production or engineering men around to get down to cases.

"Choose your show by the quality of its audience," is the usual advice. Companies also like to have home office people and key executives in the booth: "It's about the only time they can meet the customer."

Movies

Magic Carpet—A good movie is the next thing to getting the customer into your plant. You can show him what you make, how you make it, where you make it. When you have a movie, you become a publisher. You have to find ways to circulate it.

One manufacturer is making a smash hit with "show parties." Salesmen arrange to show the company movie at the customer's plant after hours and at the convenience of key personnel. After dinner (which the seller furnishes) movies are shown; and when the lights are turned on, company exhibits are rolled out. When questions are asked, sales and engineering people are on hand to answer them.

Public Relations

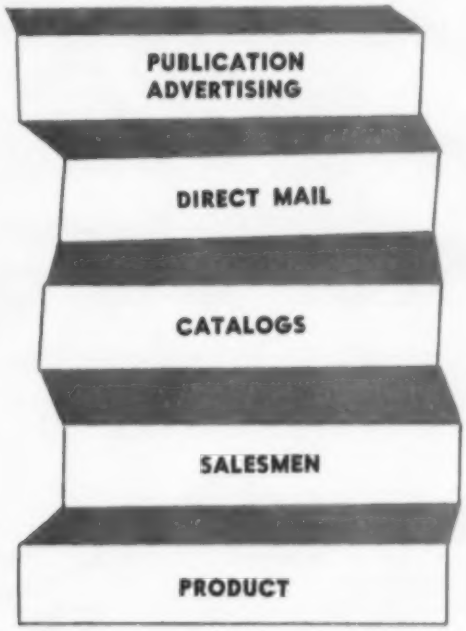
Operation Snowball — Here is the opportunity to make the editorial pages. Your product is removed from the resistance of the market place. It has been passed upon by editors and deemed worthy to share in the publication's editorial reputation.

Because of the desirability of speaking through this "approved" medium, most companies keep their news releases on a quality rather than a quantity basis. Editorial needs are carefully studied. The new product release that gets "printed" is universally regarded as the grand prize.

. . . with the fundamentals of product communication and the roles its media play out of the way, the problem boils down to one of proper . . .

Planning

All Together—Progressive management is taking cognizance of incidents like the following and



Five steps to merchandising . . .

How does a company "grow into" product communication? The evolution has been stated in this manner:

You must start with a PRODUCT that is needed or has a desire value, has a potential market, is competitively priced; plus a few SALESMEN to go out and sell it.

Next, you need a CATALOG as a reference book for customers.

Next, DIRECT MAIL cultivates customers and known prospects.

Next, PUBLICATION ADVERTISING is aimed at the larger audience, your customers, potential customers, the men who buy, the men who influence purchases.

STEEL talked to these people . . .

In preparing this article, the organizations interviewed included: John A. Roebling's Sons Corp., subsidiary, Colorado Fuel & Iron Corp., Trenton, N. J.; New Jersey Zinc Co., New York; Union Carbide & Carbon Corp., New York; Sciaky Bros. Inc., Chicago; Verson Allsteel Press Co., Chicago; Kearney & Trecker Corp., Milwaukee; Griswold-Eshleman Co. (advertising agency), Cleveland; Republic Steel Corp., Cleveland; Electric Controller & Mfg. Co., Cleveland; Tinnerman Products Inc., Cleveland.

revamping its thinking and planning accordingly:

Research and production spent several years perfecting and making the first whoosis. Sales is called in and told to "go out and sell it." Advertising is called in and told to "back up sales." Both report back in a hurry: "There is no visible market for the whoosis."

Two Lessons: Before turning a gear, go out into the market place and find out what your customers need. If they want it and you can make and sell it at a profit, have research, production, sales and advertising plan a coordinated program. For the best over-all result, their functions must be integrated.

Integrated planning will prompt you to take a new look at . . .

Budgeting

Not Enough — The traditional method of basing your product communication budget on a flat per cent of sales probably won't give you enough money to attain your integrated objectives.

Suppose your sales volume is $1 million a year. You generally spend 1.25 per cent of sales on product communication. This year you decide to double your sales over the next five years. Next year your sales should be about $1.2 million.

Your objectives call for $35,000 a year to do your product communication job. A flat 1.25 per cent of sales ($1.2 million) will give you only $15,000.

Of course, when you are spending $35,000, you like to see what you are getting for it. You look for ways to . . .

Measure Results

Proof Positive — Ideally, you would like to trace the number of orders that $35,000 brought in. But, remember, salesmen close most of the sales.

The role of product communication is to pave the way for your salesmen. It is a never-ending educational process. Its prime objectives are to inform the men who buy and the men who influence purchases among your customers and potential customers:

1. Who you are.
2. What you make.
3. What your reputation is.

If you want to test the effectiveness of your product communication campaign, have an outside agency ask your customers and potential customers those questions. You'll have to wait two years for a good indication of how well you are known.

Say you find 25 per cent know you this year. If the rating is 35 per cent next year, you know product communication is doing an effective job.

Is this enough?

The Payoff

L. M. Cole, sales manager, Warner & Swasey Co., says:

"Through our sales managers and officers it is our business to be in touch with as many customers and prospective customers as we can. We all have the same experience—wherever we go and talk to key executives, we are told that our product is being favorably considered or that the sale actually has been consummated because of the reputation our advertising has built for our company."

Mr. Cole concludes: "Through this advertising Warner & Swasey has sat in thousands of directors' meetings, executive committee meetings, production executive meetings, where no Warner & Swasey man could ever sit—but Warner & Swasey, I repeat, has sat there and has spoken forcefully because our philosophy has spoken for us—our philosophy as expressed in our advertising."

George Romney had something like this in mind when he said: "We believe we can do it on our own."

ANSWERS TO QUIZ ON PAGE 73

1. Yes. It opens doors by telling who you are, what you make, what your reputation is.
2. Rarely. Most industrial sales are made by salesmen.
3. No. But you can make it pay by knowing how to use it effectively.
4. No. Successful product promotion should be measured in terms of how it helps salesmen (see answer to question No. 1).

Here is perfection!

ROEBLING high carbon wire is unsurpassed for industry today. Roebling wire is absolutely true to specifications ...absolutely uniform in gauge and finish. Manufacturers who try Roebling wire once, become Roebling customers from then on.

You *pay* for the best when you buy high carbon wire. Make sure that you *get* it! Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

The Jonker, world's largest emerald-cut diamond.

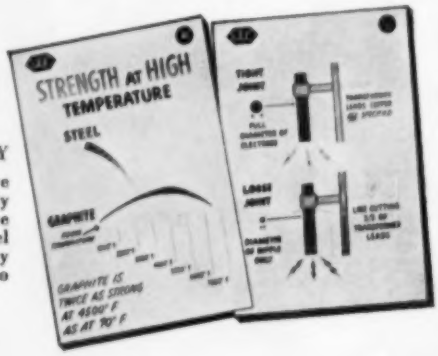
BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

MAKE YOUR ELECTRODES STOP LOAFING!

Let your men see and hear *The Electrode Story* — a shop-level informational program aimed at developing optimum electrode service for electric steel producers.

This series of four illustrated talks — developed especially for melt shop personnel — gives the men-on-the-furnace a better knowledge and understanding of electrode handling and joint assembly.

***The Electrode Story* was developed to help effect important economies in electrode utilization, and thus contribute to the advancement of the electric steel industry as a whole. It is being made available to electric furnace steel producers without charge or obligation. This forward-looking program can help your company get optimum service from electrodes and substantially reduce electrode costs.**



Typical Panels From THE ELECTRODE STORY

Two of the many informative panels that dramatize simply yet forcefully the importance of electrodes in electric steel making, and the reasons why proper shop practice is so important.

Inquiries about *The Electrode Story* are most cordially invited. Write to . . .

ELECTRODE DIVISION

Great Lakes Carbon Corporation

GLC

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JOIN THIS RAPIDLY GROWING GROUP OF ELECTRIC STEEL PRODUCERS who have benefited from *The Electrode Story* informational program.

Allegheny Ludlum Steel Corporation
Copperweld Steel Company
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Firth Sterling Inc.
Fort Pitt Steel Casting Co.
Jessop Steel Company
McQuay-Norris Manufacturing Co.
National Malleable and Steel Castings Company
Newport Steel Corporation
Northwestern Steel & Wire Company
Rotary Electric Steel Company
St. Louis Steel Casting Company
Sterling Steel Casting Co.
. . . and many others

HERE'S WHAT ELECTRIC STEEL PRODUCERS SAY ABOUT *The Electrode Story*

". . GLC is setting the pace on education within the industry."
". . brings home to the men the importance of proper handling of materials."
". . the improvements were very noticeable."
". . is proving helpful in reducing consumption."
". . has shown marked improvements in the Melting Department."
". . one of the best things that ever happened to educate the men on the furnace."
". . the results of the lectures are noticeable daily in the extra care taken in handling and assembling electrodes."
". . a model of the use of visual aids and of conference and discussion techniques."
". . the men are more careful now."
". . proved very beneficial in better handling of electrodes."

"Great Lakes takes the long-range view that it is better to sell an extra carload of electrodes because a customer has added another furnace, than because he is getting less-than-optimum service out of his existing equipment"— from an article in STEEL.

STEEL

February 14, 1955

Technical Outlook

WEAR TOLL— Four ounces of metal lost by wear from vital parts of a 4000-lb automobile may be all the weight difference between a noisy, unsafe machine ready to be junked and a new smooth-running car. How can camshaft lobes, valve lifters, piston rings and power train gears be made to wear less rapidly? What metal surfaces are more compatible, will abrade each other less than those we are using? These are questions posed by G. C. Riegel, chief metallurgist, Caterpillar Tractor Co., in a special report for SAE's golden anniversary.

STRESSES HELP—Another question raised by Mr. Riegel: As stresses act to destroy, cannot stresses also be made to help preserve the structure? Beneficial residual stresses can be used to extend the life and raise the safety factor of many machine components. For example, in aircraft the gears, connecting rods, crankshafts, rocker arms, valve springs and many other parts are shot peened to make less metal do more work.

LOW-TEMPERATURE FIRE— Ansul Chemical Co. has developed a fire extinguisher that works at −65°F. It uses a special rubber hose that stands extreme cold without stiffening or cracking. Nitrogen rather than carbon dioxide expels the extinguishing agent, a dry chemical.

WIDE RANGE— Ductile iron castings are produced commercially in weights from 2 oz to 100,000 lb, with section thickness varying from 1/10 to 48 in., reports International Nickel Co.

MORE TESTING— General tone of a report by ASTM after a 10 year study of the salt spray test by a special task force: Wider acceptance of 5 per cent salt spray for general testing is encouraged. Data given indicates the acetic acid modified salt spray to be more accelerated and more universally applicable. It is not reasonable to expect test results to match service performance perfectly in color or appearance, said the task force. It is sufficient to be able to say: "The item that fails first in test will fail first in service", or better: "If it does not fail in x hours in test, it will probably withstand one year of average service."

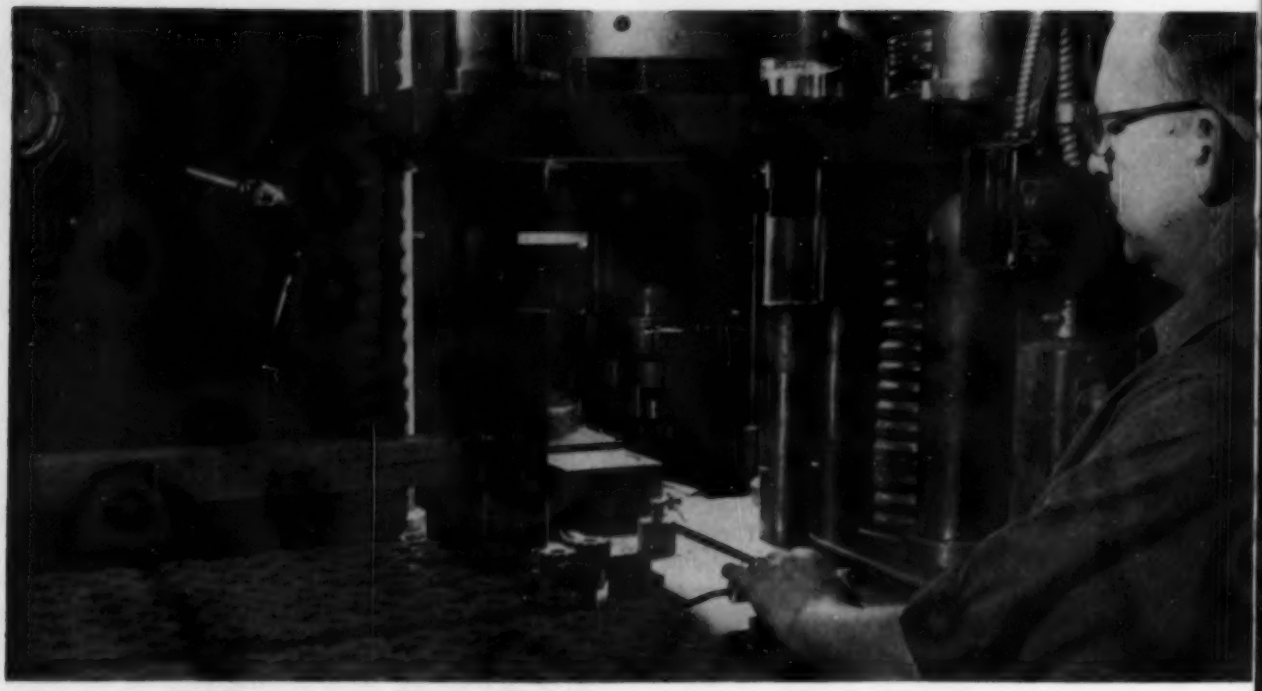
TRANSITION MOTORS—That the two-year-old NEMA electric motor rerating program is meeting with some user resistance is indicated by the number of old-standard motors still being built. General Electric, for instance, recently announced what they call a transition line of motors . . . old frame sizes and dimensions, but incorporating all the design features of the new, rerated motors. Others will probably follow suit.

NOVEL PICKLE— Purpose of a new pickling line installed at American Silver Co. is to remove abrasive scale on beryllium-copper strip. In one plant, die wear was reduced 42 per cent when the switch was made from strip coated with beryllium-copper oxide scale to clean stock.

MORE COMPUTERS— Within the next two years, IBM will deliver 400 of its Type-650 magnetic drum computers. Rental: $3,750 a month. GE has just received number three, the first for nongovernment use, and will put it to work on electrical system engineering problems.

Others will handle jobs from turbine flow to payrolls. For example, the auto industry one could remember an advance production schedule, calculate the number of parts needed, take into account lead time and calculate dates on which orders should be placed to assure delivery.

Metalworking Outlook—p. 27 Market Outlook—p. 123



Prealloyed 4650 steel powder feeds this press to make . . .

Powdered Metal Gears for Tougher Jobs

IN AUGUST 1952, a maker of hydraulic pumps set out to cut gear costs. By the end of last year the company had sold more than 40,000 pumps equipped with a new kind of gear. It was then announced that the gears were made of powdered metal at a 20 per cent saving.

The pumpmaker is Hydreco Div. of New York Air Brake, Cleveland. The gears it's using are made by Keystone Carbon Co., St. Marys, Pa. The prealloyed 4650 steel powder is produced by Vanadium Alloy Steel Co., Latrobe, Pa.

The gear process is similar to that used in making high-density iron parts. The difference is that instead of starting with electrolytic iron powder, Keystone starts with prealloyed steel powder.

Bonus Factors—The outstanding advantage of alloy steel powder is its high hardenability. This makes it possible to develop full hardness in large sections that cannot be hardened using iron-carbon mixes.

Because the powders are completely alloyed, parts molded from them respond to heat treatment in the same way as cast or wrought metal of the same composition.

Keystone says that the alloy steel powder improves the strength, toughness and wear resistance in the same proportion as 4650 alloy steel has advantages over plain carbon steel. The growth in heat treating is slight and uniform from piece to piece. Through hardenability is another important factor.

Direction — For the past few years the trend in powder metallurgy has been in the direction of precision parts with physical properties of wrought materials.

One of the first steps to increase the strength of powdered metal parts was to infiltrate porous iron with another metal, such as copper or a copper alloy. This improved strength and gave good damping properties on parts, such as jet rotor blades.

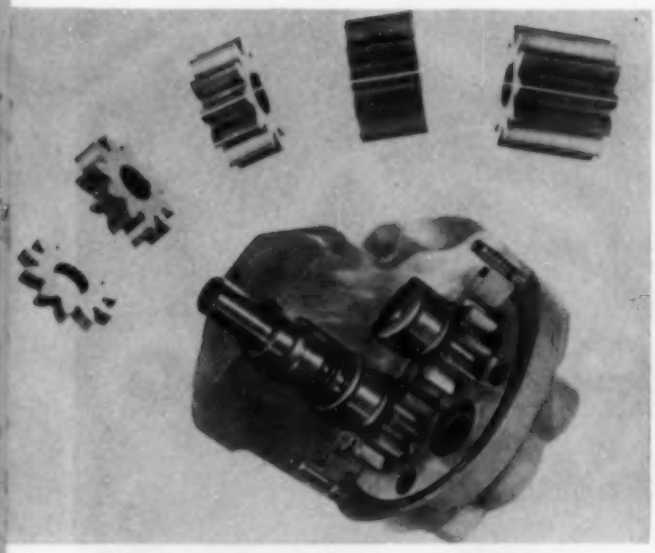
But infiltration also has its limitations. And some of the advantages of the powder metallurgy process are lost. The excessive size change and distortion that occurs cannot be corrected by a coining operation. The finish in many cases is marred by surface erosion, especially on larger parts.

In its work with high density, high strength powder parts, Keystone gets good results with electrolytic iron powders.

But the normal growth and distortion that occurs in carburizing and quenching may be a disadvantage in maintaining close tolerances. This shows up mostly in parts of intricate design or those with nonuniform density distribution and in cases where deep carburizing is necessary to give the needed properties.

Analogy—One of Keystone's engineers, N. A. Arnold, says they reasoned this way: Since the steel industry widened its horizons by developing alloy steels, powder metallurgy should seek better physical properties in the same metallurgical way.

They tried adding alloying agents to iron powders. But the long sintering time required for complete diffusion of the alloying



Hydraulic pump uses alloy powder gears

HOW ALLOY POWDERED GEARS ARE MADE

1. Press 4650 powder into green compact
   Press capacity—150 tons per sq in.
   Production rate—200 gears per hr
2. Sinter at 2200° F for one hour in atmosphere neutral to carbon potential
3. Coin using same press as for compacting
4. Resinter at 2200° F
5. Recoin to desired density
6. Anneal
7. Oil quench from 1600° F

agents ran costs up.

The idea took on new meaning when Vanadium Alloy Steel Co. developed 4650 prealloyed steel powder. The first 100-lb lot was received at Keystone's plant in March, 1949.

Ready — Development work in molding alloy steel parts moved swiftly. In August, 1952, when Hydreco contacted Keystone on the problem of producing a high strength gear for their hydraulic pumps, they knew where to start on the problems.

Tungsten carbide tools designed to stand the high pressing pressures were built. The first gears were sent to Hydreco for testing in March, 1953.

After thousands of test hours, Hydreco engineers were convinced that performance of the powder gears was equal to, if not better than, their cut gears.

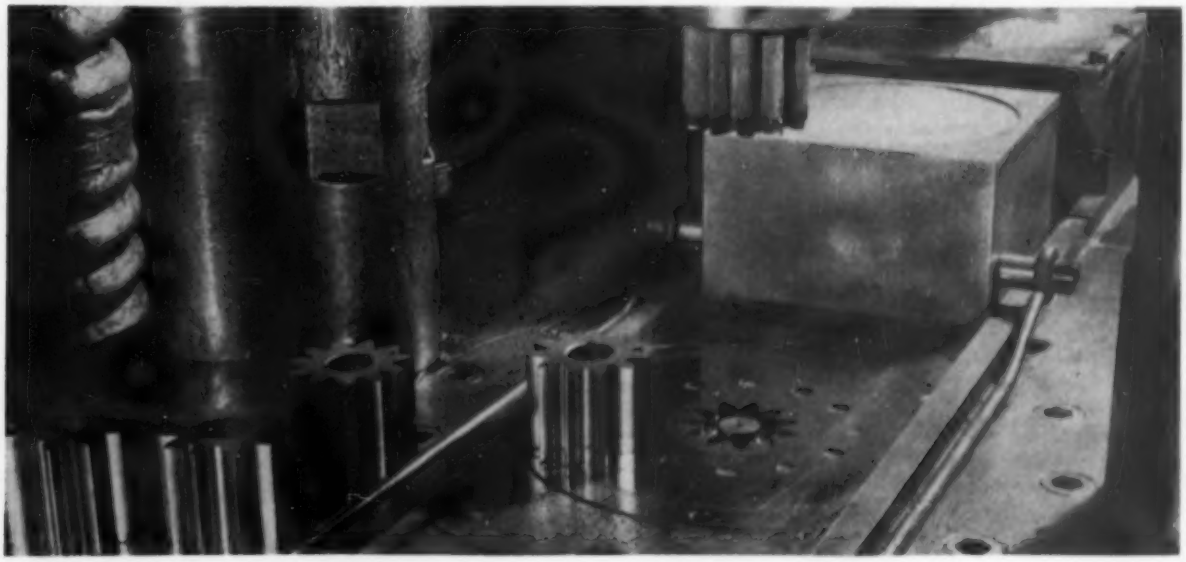
Uniformity of one gear to another, good surface finish on the teeth, excellent wearability, high strength and a 20 per cent cost reduction were factors which led Hydreco to approve the gears for production.

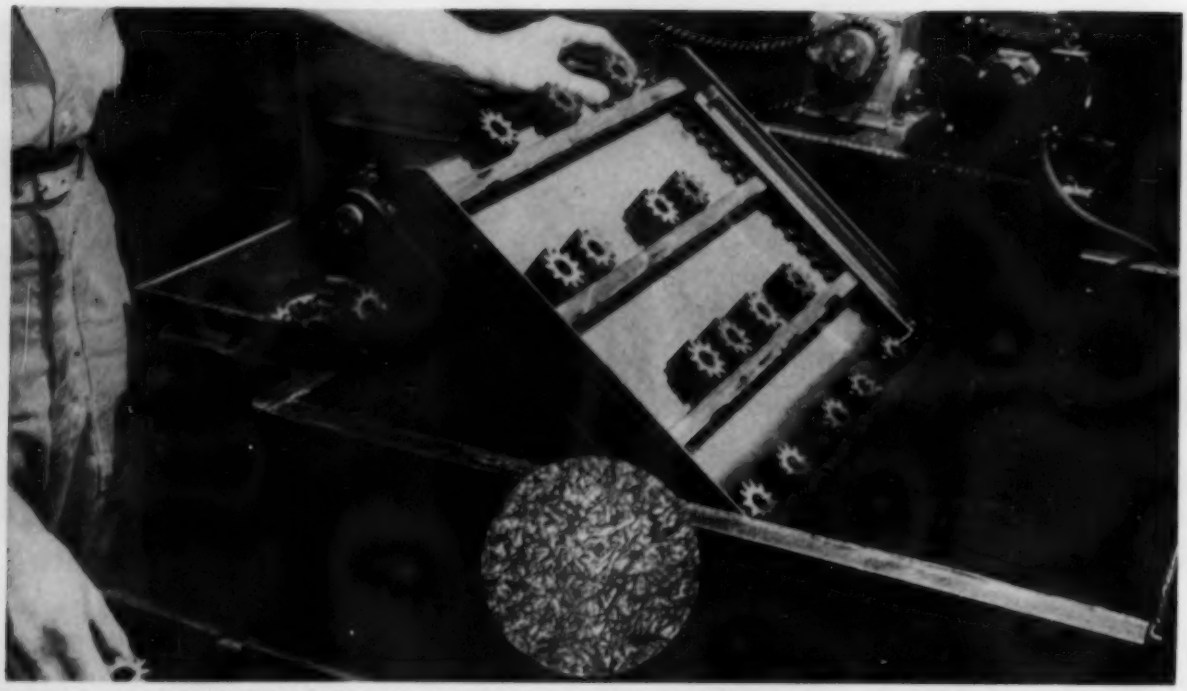
Volume—Now it was up to Keystone to get into volume production. A few months after the samples were approved (about a year from the date the first test gears were submitted) the first production quantity of 5000, $\frac{5}{8}$-in. gears was sent to Hydreco.

Here's how they are made on a production basis: The 4650 powder is pressed into a green compact at the rate of 200 gears per hour on a 150-on hydraulic press. In the molded condition the gears are fairly fragile and must be handled carefully.

The green gear then is sintered for one hour at 2200°F in an atmosphere neutral to carbon content.

Powder is pressed into green compact at rate of 200 gears per hour





Gears are heated to 1600° F in a protective atmosphere, then dropped one at a time into quenching oil. Escalator brings quenched gears out of oil bath. Structure (inset) is completely martensitic

Sized—Next, the sintered gear is coined, using the die and press that was used for compacting. It then goes back into the furnace for resintering at 2200°F.

Next it's recoined, using the same die and press, annealed and heat treated.

To heat treat the gears, they are brought to 1600°F in a protective atmosphere. Then without being removed from the atmosphere, they are dropped one at a time down a chute into the quenching oil. An escalator brings the quenched gears out of the oil bath. The structure is completely martensitic. Particle hardness is Rc 50 minimum.

Variety—Keystone makes seven different lengths of gears in the same set of tools. The size range is ¼ to 1½-in. A 1¼-in. gear is the large volume item. Sample lots of gears 1¾-in. long have been approved.

No wear is shown on the die that has been used for 100,000 alloy powder gears. This means the equivalent of 300,000 gears have been formed in the same set of tools, counting, molding, coining and recoining operations.

Bright—Keystone says the outlook for the high strength alloy powdered gears is good. Parts have been supplied to many companies for testing. In some cases tools are being built and in others (not necessarily gears but parts of the same high strength alloy steel) tools are completed and preproduction samples have been sent.

Potential applications for the high strength powder parts are gears, rollers, pawls, bushings, cams and other structural shapes. For parts where lower tensile strength is all right, it's cheaper to use powdered iron.

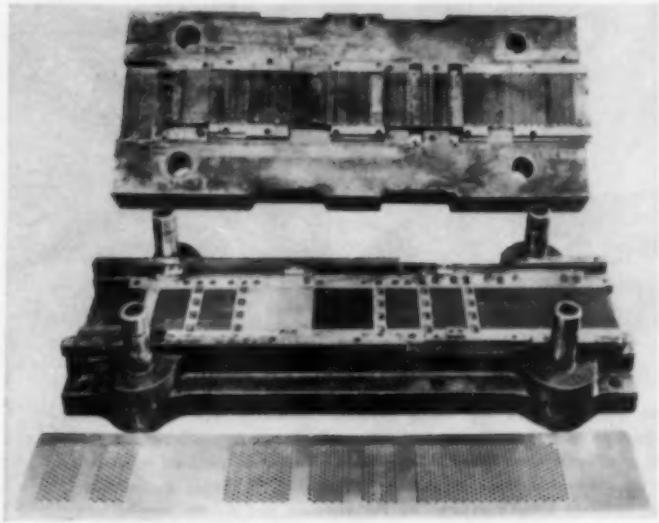
Keystone figures that the biggest parts it can handle today have a cross section of 9 in. and maximum thickness of 6 in. The maximum surface area is not to exceed 10 sq in.

By cutting its gear costs by 20 per cent, Hydreco has done what it set out to do. For the time being it will use powdered gears in only one pump model (the most popular in its line) and continue to use cut gears in the rest. It guarantees the powdered gears to equal or surpass performance of the machined ones.

PROPERTIES OF ALLOY POWDERED GEARS

Apparent density, g/cc	7.5
Ultimate tensile strength, psi	*115,000
Yield point in tension, psi (0.2% offset)	85,000
Elongation in one in., per cent	1.5
Yield point in compression, psi (0.2% offset)	80,000
Compact hardness, Rockwell	C30
Particle hardness, Rockwell equivalent	C50
Modulus of rupture, psi	195,000
Radial crushing strength "K" value, ASTM, psi	250,000
Chemical composition	C - 0.30 Si - 0.23 Mn - 0.45 Ni - 1.50 P - 0.009 Mo - 0.20 S - 0.008 Fe - Bal.

* Keystone Carbon says that through recent research ultimate tensile has been increased to 140,000 psi.



This large blanking die is used on 20-gage, SAE 1010 strip for auto muffler tubes. Because premature breakage of the teeth is a problem, an air hardening steel with good toughness is used

This die has 194 holes. A chromium-manganese-molybdenum analysis gave no size change or movement during heat treatment

HEAT TREATING TOOL STEELS

Oil and Air Hardening Types

By H. C. Manley and G. E. Brumbach
Carpenter Steel Co.
Reading, Pa.

This is the fourth in a series of five articles on heat treating tool steels by Messrs. Manley and Brumbach. First, Jan. 24, second, Jan. 31, covered water hardening types. Third, Feb. 7, discussed fundamentals of treating oil and air hardening types. Final article, Mar. 14, will deal with hot work and high-speed tool steels.

DISTORTION, WARPING and general size change in heat treating a tool or die are reduced by using an oil hardening analysis. With air hardening compositions, the dimensional difference between the heat treated and machined condition is minimal.

The magnitude of the distortion effect is illustrated by the Navy C-ring specimen. Response of its slot dimension to heat treatment is commonly used as a measure of the amount of distortion that can be expected. It is a valuable tool for cataloging this important property.

Experience with this test indicates that the slot dimension of a C-ring made from the typical oil hardening analysis (Fig. 1) increases by about 0.0137 in. when it is hardened from 1450° F, and then drawn at 375° F to a hardness of 61 to 62 Rc.

The typical air hardening composition (Fig. 2) decreases by about 0.0016 in. when hardened from 1750° F and then drawn at 400° F to a hardness of 61 to 62 Rc.

Stability—This is the reason the air hardening steels are used for intricate tools and dies that must maintain exact size and shape relations after heat treatment. Their distortion characteristics are about one tenth that of an oil hardening steel.

Although distortion and warping are reduced by using oil or air hardening types, tools and dies of marked difference in section size or of complicated design are subject to more movement when conventionally quenched than can be tolerated in modern manufacturing processes.

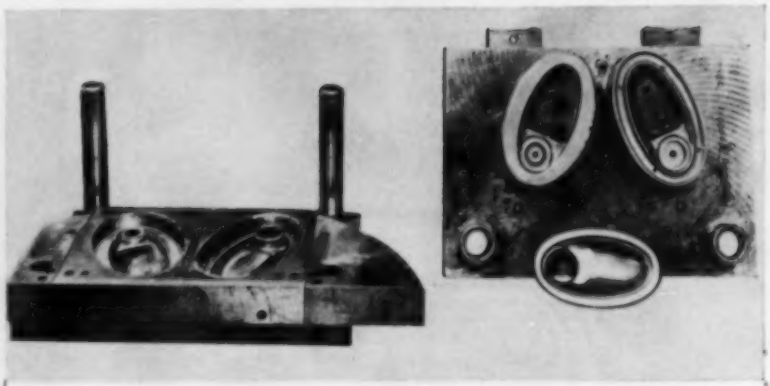
This trouble is traced to the unequal stress distributions set up by the transformation of austenite to martensite at different time intervals in various sections. Several

heat treatment methods have been developed to minimize temperature gradients in the work during hardening.

Salt Quench — Martempering is one. The work is quenched into a salt bath at a temperature slightly above the point where martensite starts to form. For an oil hardening analysis similar to that of Fig. 1, a temperature of 400° F is used. The tool or die is held in the hot salt until the temperature is uniform throughout. Then it is cooled in still air to room temperature.

This procedure gives less distortion and cracking if the work is of intricate design. Reason: The temperature gradient throughout the piece during the formation of martensite is small.

Slower Cooling—Although distortion is less in martempering, the heat treater must realize that the slower rate of cooling when a tool or die is quenched in salt at 400° F restricts the technique to fairly thin sections of the shallower hardening analyses or moderate sections of the deeper hardening grades.



This tool blanks, pierces and forms oval muffler heads from 20-gage cold-rolled steel on a 70-ton press with an output of 100,000 pieces per grind. The tool steel must meet several requirements: Hardening accuracy to avoid a honing operation; toughness to prevent chipping on the edges during blanking and piercing; wear resistance on the surfaces that do the forming. An air hardening steel with 1 per cent carbon, 0.70 manganese, 0.20 silicon, 5.0 chromium, 1 molybdenum and 0.20 vanadium does the job

For the analysis in Fig. 1, essentially full hardness of 64 to 65 Rc is obtained at the center of 1¼-in. sections when oil treated from 1450° F. But the size that develops full hardness at the center on quenching from 1450° F into a salt bath at 400° F followed by air cooling to room temperature is about ¾-in.

Important, Too—The time at the martempering temperature (shown

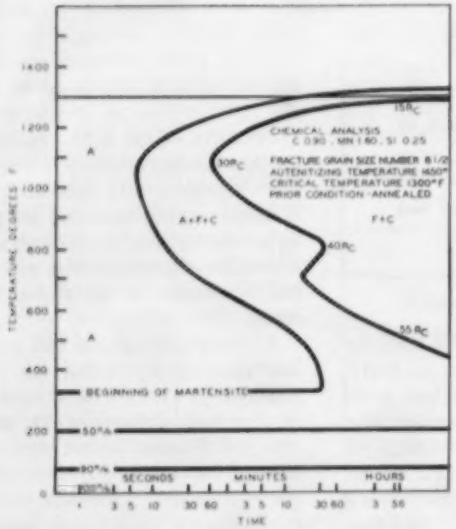


Fig. 1—The time-temperature-transformation of a typical oil hardening analysis

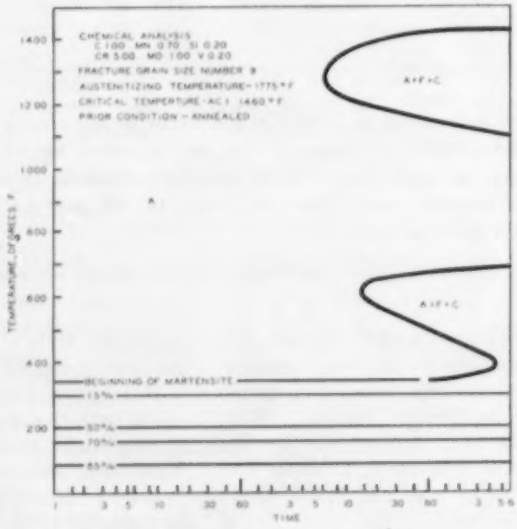


Fig. 2—The time-temperature-transformation of a typical air hardening analysis

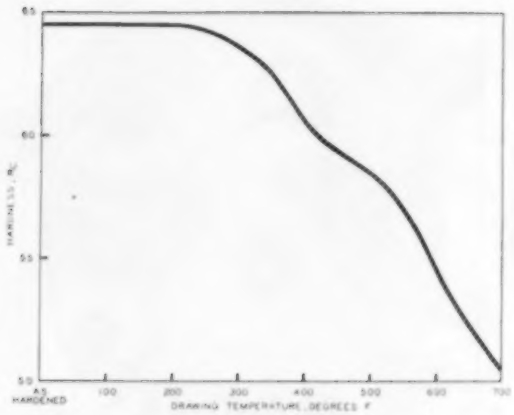


Fig. 3—How drawing temperature affects hardness of a typical oil hardening tool steel

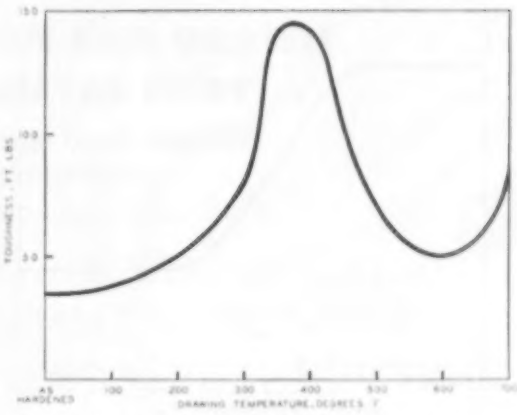


Fig. 4—How drawing temperature affects toughness of a typical oil hardening tool steel

by the time-temperature-transformation diagram) also determines the maximum section size that can be successfully treated: All the heat in the tool or die, from the hardening temperature to that of the martempering bath, must be removed in the time indicated by the diagram.

Although martempering is used most satisfactorily with oil hardening grades, the distortion of tools or dies made from air hardening analyses can be reduced to some extent by the technique.

Bainite—Martempering is used to get a fully martensitic structure in the hardened condition. Another treatment, austempering, gives complete transformation of austenite to bainite. A bainitic structure has better toughness at relatively high hardness than martensite.

The time-temperature-transformation diagram of the oil hardening composition in Fig. 1 shows that the maximum hardness of a completely bainitic structure is 58 to 60 Rc.

Although good toughness at a hardness of 58 to 60 Rc is desirable for some applications, such as coining and cold forming or bending dies, austempering is not widely used. Reasons: The extended time needed to form a completely bainitic structure and the loss in hardenability when a tool or die is quenched in salt at 400° F.

Stays — The time-temperature-transformation diagram of a typical air hardening steel (Fig. 2) indicates that a considerable amount of retained austenite results when quenched from 1750°. This is particularly so in the highly alloyed compositions, especially if overheated during hardening.

Subzero—Since a structure as completely martensitic as possible is needed to realize optimum mechanical properties, cold treating is becoming important.

The work is treated in the range of −120 to −150° F until temperature is uniform throughout. Transformation of austenite to martensite is completed. The treatment is most effective when done shortly after the room temperature quench, provided the tool or die is of simple design.

With tools and dies having thick and thin sections or sharp corners, the cold treatment should be performed slowly or preceded by a draw, temperature of which depends upon the analysis.

Tempering—Even with oil and air hardening analyses, tools and dies are always in a nonuniformly strained condition after heat treatment—air hardening tools to less extent than oil hardening ones. This makes tempering necessary. It relieves hardening strains and increases toughness.

Because cracking may occur before drawing, the tool or die should be tempered as soon as possible after the quench, especially if it is of moderate section size and of an oil hardening analysis.

A good rule: The tool or die should be cold enough to hold with bare hands, particularly with the more highly alloyed air hardening types. They tend to retain considerable austenite unless properly quenched to room temperature.

Pointers—In drawing, heat the tool slowly and uniformly in a circulating medium to the temperature needed. A few pointers: Heat the work up with the furnace, if it is of complex design. Allow adequate time at the draw temperature, depending upon the size and shape of the parts. Cool the work to room temperature in still air.

Tools and dies made of oil or air hardening analyses are generally drawn at 300 to 700° F. Time needed to reach a drawing temperature is about 20 minutes per inch of the thickest section if

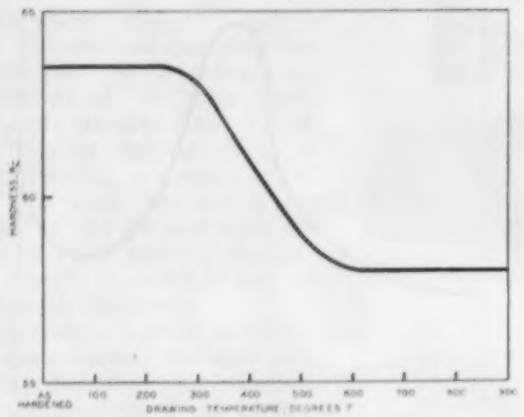


Fig. 5—How drawing temperature affects hardness of a typical air hardening tool steel

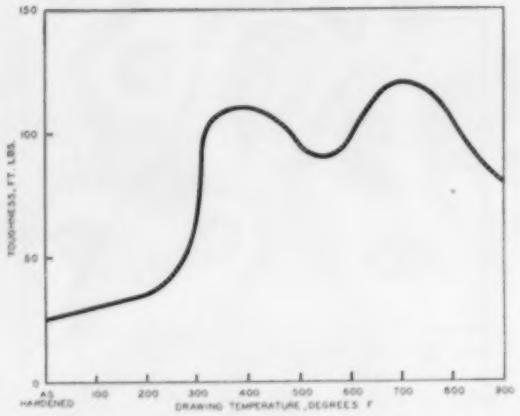


Fig. 6—How drawing temperature affects toughness of a typical air hardening tool steel

the furnace has a well circulated atmosphere.

When drawing temperature is reached, practice is to hold the work at temperature for one hour per inch of the largest section. Better performing tools result when the work is drawn for a longer time than the dimensions of the tool or die indicate. The temperature is lowered somewhat to compensate for the longer time.

Lower Temperature—Tools and dies of oil hardening analyses generally give optimum mechanical properties when drawn in the range of 300 to 500° F. Fig. 3 shows the effect of drawing temperature on hardness and toughness of an oil hardening analysis of 0.90 per cent carbon, 1.60 manganese, and 0.25 silicon. With increasing draw temperatures, hardness falls off in a regular manner.

Toughness as measured by the torsion impact machine for this analysis is given in Fig. 4. Toughness increases rapidly, goes through a maximum in the vicinity of 400° F, decreases to 600° F and then increases again.

If the heat treater understands the change in important properties with temperature for this analysis, he can get the most desirable combination of hardness and toughness for a particular application.

Data given in Fig. 3 and 4 were obtained after oil treating from 1450° F and then drawing for one hour at each of the temperatures. Results show that the optimum combination of toughness and hardness is obtained when a tool is drawn at 375° F for one hour. Essentially the same hardness and toughness are realized when the work is drawn at 350° for four hours or at 325° F for eight hours.

Less Hardness Lost—The effect of draw temperature on the hardness and toughness of the typical air hardening analysis is given in Fig. 5 and 6. It can be seen (Fig. 5) that the loss in hardness with increasing drawing temperature is not so great as for the oil hardening analysis. Evidence: The drawn hardness at 900° F is only about three points below the value at 400° F.

The presence of two toughness peaks is characteristic of steels that have an appreciable amount of retained austenite in the as-hardened condition. The austenite usually transforms to martensite upon cooling from drawing temperatures in the vicinity of the depression between the two peaks.

Peaks—Tools and dies made of this type of air hardening analysis generally are drawn in a manner to take advantage of one of the two toughness peaks, depending upon the combination of hardness and toughness needed for the application.

For example, a part that requires more hardness than toughness is drawn at 400° F for one hour, 375° F for four hours or 350° F for eight hours, depending upon the size of the work.

For service conditions that demand more toughness than hardness, the work is drawn at 700° F for one hour, 675° F for four hours or 650° F for eight hours, again depending upon the dimensions of the tool or die.

Others—The typical oil and air hardening analyses discussed can be used in the majority of applications that require a good balance of hardness and toughness. For conditions that demand better wear resistance, the high-carbon high-chromium oil or air hardening analyses are used.

For superior toughness at high hardness the chromium-nickel oil hardening and manganese-chromium-molybdenum air hardening compositions are employed.

Coming Mar. 14—Hot work and high-speed tool steels

a CMP-cost cutting report

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COKE
Part II

Burdening the Blast Furnace

What is the ideal coke? Blast furnace men are finding it's more than chemical composition that counts. Here is some composite thinking on desirable physicals as well

By M. W. LIGHTNER
Assistant Vice President
Research and Technology
United States Steel Corp.
Pittsburgh

WHAT steel-plant manager has not heard his blast-furnace superintendent remark: "The coke is no good. I can't make iron!"

It must be remembered that unequivocally the most important variable affecting coke quality is the coal or coals from which the coke is made. Much basic information has been accumulated on the effects of the microconstituents of coals, such as the vitrinite, micrinite, fusinite, etc., but the fact still remains: The only way of knowing the properties to be expected from a given coal or blend of coal is to actually run coking tests.

Check Characteristics — Consequently, many steel companies maintain small experimental ovens, (Fig. 3) to check the coking characteristics, such as wall pressure, and to determine the properties of coke resulting from various coals and blends of coals. It has been determined that the correlation between coke produced in small test ovens and in commercial ovens is good. As a result, small test ovens can be used to evaluate coal quality for coke production.

Fig. 3—Pushing coke from experimental ovens

Evaluation of Ideal Coke—The chemical composition of blast-furnace coke is important in considering its suitability as a source of fuel and as a source of reductant. Also, the belief is widely held that the physical properties of the coke are at least as important as the chemical properties, but there is no general agreement as to what physical properties are important for good performance nor how these properties should be measured.

Fixed Carbon — Since coke is primarily a source of carbon to supply the fuel and to produce the reducing gas in the furnace, it is obvious that the fixed carbon content should be high and the volatile matter and moisture should be as low as possible.

The mineral matter or ash content of coals has increased in recent years, owing largely to the

stainless steel, too, means more than a shining face

A healthy youngster's natural grin is "chromium plated" after a conflict with soap and water. But it's his all-the-way-through character that measures his ability to cope with problems.

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Sun Ship has earned a reputation for mastering many special problems in its decades of service to the chemical, petrochemical, petroleum and other industries which face problems in fabrication and specialized machinery.

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NEW KENDEX* TOOLING

costs less on all 3 counts

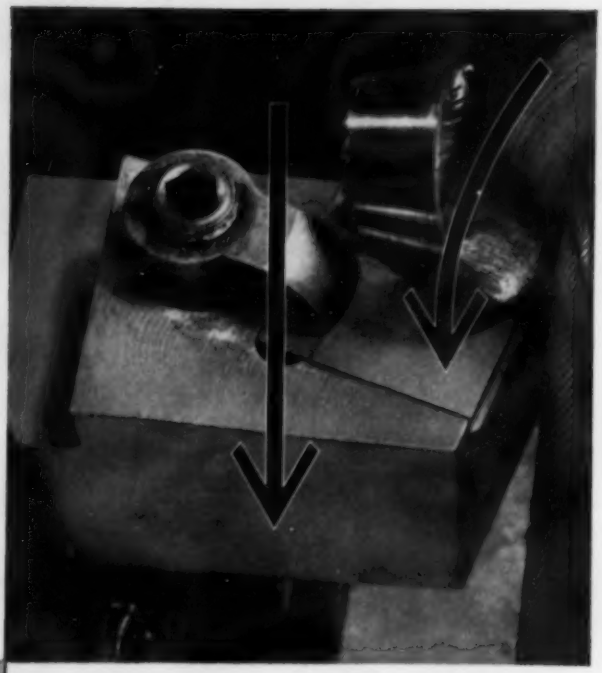
. . . initial cost, tool cost per piece and parts replacement cost

Each component of the *new* Kendex Tooling has been designed with but one thought in mind . . . lowest possible cost per cutting edge.

The holders are of simple but sturdy construction, and have the capacity to take deep cuts in a wide variety of operations. The clamp lifts for quick, accurate indexing, and is so designed that clamp forces are in the same direction as cutting forces—not opposed to them—to avoid counter stresses. Hardened, replaceable shims, on all but the smallest size, protect shanks in case of accidents with the tools. There is no complicated seat adjustment mechanism to weaken the Kendex shank. Kendex "turnover" inserts fit perfectly into place in accurately ground seats, and are supported by solid, heat-treated shanks. Center height of the cutting point is constantly maintained.

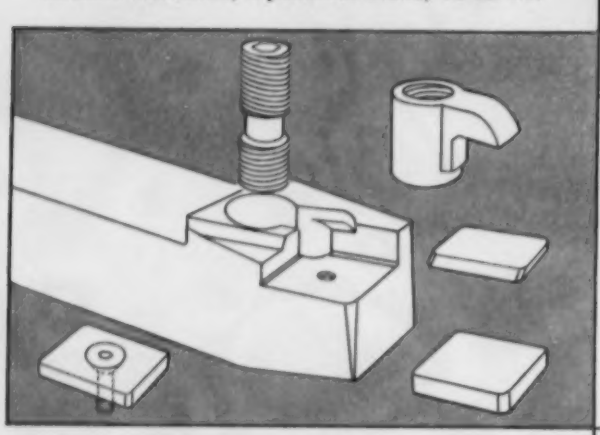
The new Kendex is available in a range of sizes in nine styles and two models: (1) Standard Tool used with or without replaceable chipbreakers, for a wide variety of average operations; (2) Heavy Duty model, with low cost, replaceable chip deflector, for cutting heavy and irregularly shaped forgings or castings where depth of cut may vary as much as one inch from side to side. *Both models use "throwaway" inserts . . . eliminate grinding.*

To learn how you can cut machining costs on all three counts, call your Kennametal representative, or write to KENNAMETAL INC., Latrobe, Pa.



The effectiveness of the rugged Kendex holder can be measured by its capacity to take a variety of cuts, from extra light to very deep, using the same tool.

Clamp forces are in same direction as cutting forces—and not opposed to them. This is indicated by the arrows in the above photograph. Counter stresses are thus eliminated, adding to tool life.



<- The new Kendex is simple in design with a minimum of parts . . . no complex mechanism to adjust or fail. "Throwaway" type inserts index quickly and accurately in the rugged, heat-treated shank, with cutting edge perfectly aligned. Clamp has sufficient travel to hold insert when carbide chip-breaker is not used. Shim (where used) screws to holder.

The table below gives a comparison of initial cost of Kendex holder and hardware with a comparative, competitive tool. Note the low cost of replacement parts for the Kendex KAR 16.

TOOL COST COMPARISON

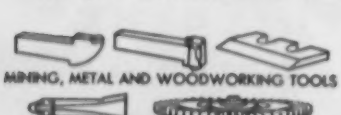
(1" x 1" shank, without inserts)

Toolholder "A"		Kendex KAR 16	
Holder only	$25.00	Holder only	$ 8.00
Hardware:			
Chipbreaker plate	$3.50	Hardware:	
Elevator	4.25	Shim†	$0.90
Main screw	1.00	Clamp	1.25
Chipbreaker plate screws	0.35	Clamp Screw	0.15
	9.10		2.30
Total initial investment	$34.10	Total initial investment	$10.30

†Hardened, replaceable shim absorbs stresses of any possible overloading beyond tool capacity. Inserts last longer and machining costs are held to a minimum.

*Registered trademark

9910



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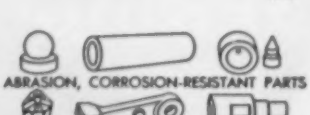

ABRASION, CORROSION-RESISTANT PARTS

PERCUSSION AND IMPACT PARTS

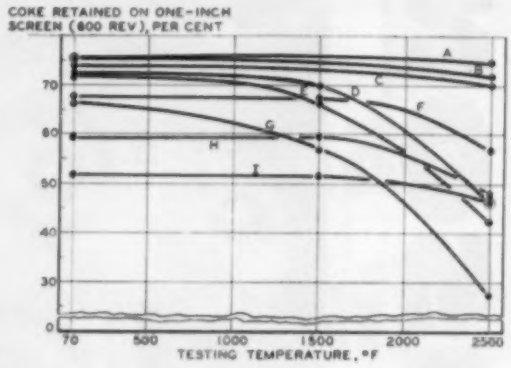

Fig. 4—Effect of testing temperature on degradation of coke

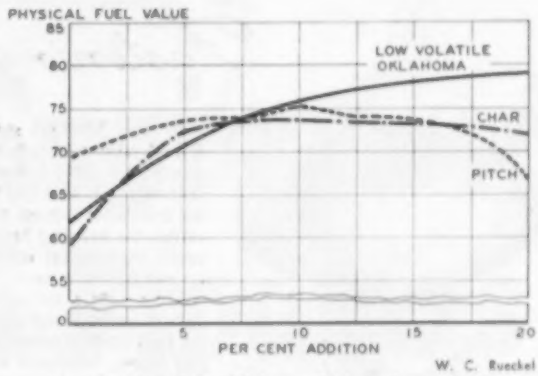

Fig. 5—Effect of additions of pitch, low-volatile coal and char on physical fuel of Sunnyside Utah coal

necessity of mining lower grade coals and the installation of mechanical mining equipment in many mines. Necessarily, coal-washing equipment has been installed; today, a large percentage of metallurgical coal is washed. The mineral matter contained in coal and in coke is largely silica, alumina and some iron oxide. Of course, coke of a higher ash content necessitates more flux, with a corresponding increase in slag volume and increased fuel consumption.

For example, it is estimated that a 1 per cent increase in the ash content of coke at a net coke rate of 1750 lb per ton of iron is equivalent to an increase of 55 lb of coke per ton of pig iron.

Sulphur Source — With the possible exception of those blast furnaces in this country using California iron ores, or foreign ones such as Peruvian ore, practically all sulphur entering the furnace burden comes from the coke, and for all practical purposes, all the sulphur which enters is discharged either in the slag or in the iron.

It has been noted that when different coals are coked it is difficult to predict the relative amounts of sulphur which will remain in the coke or will be driven off into the gas or tar; in the coking of many coals, the ratio of sulphur in the coke to sulphur in the coking coal increases as the total sulphur in the coal decreases. Attempts to explain this behavior by the relative amounts of sulphur contained in the coal as pyrites or as organic sulphur have not proved adequate.

Nevertheless, from 50 to 75 per cent of the sulphur in the coal will usually remain in the coke. Naturally, higher sulphur in the coke causes an increase in the flux costs and fuel rate of the blast furnace and adversely affects the sulphur content of the iron.

Physical Properties—Before coke is charged into the blast furnace, it is subject to degradation both by impact and abrasion as a result of handling. In the blast furnace, coke is required to have sufficient strength to support the burden without crushing. It is the primary component of the charge upon which the operator relies: To keep the burden permeable and free from *hanging*; to prevent channeling of the gases, with accompanying *hot spots*, decreased refractory life and irregular furnace operation.

Generally speaking, coke which is more resistant to impact and abrasion and, consequently, with the highest strength factor, is considered to be the best blast-furnace fuel. There can be no doubt that high-strength coke results in less coke breeze at the ovens and a higher percentage of oven coke available at the blast furnace, but little is known of the relative importance of coke strength to blast-furnace performance.

Little Data—A limited amount of experimentation has been done in this country and abroad to study the degradation occurring from the stockline to the tuyeres, but the extreme difficulty of obtaining representative samples at various column heights has contributed largely to the lack of useful data. The use of high-speed movies at U. S. Steel Corp.'s Fundamental Research laboratory, Kearny, N. J., to record action in the hearth as seen through the tuyeres, indicates that this technique offers a means for studying degradation of coke.

This work, though still in progress, indicates there is little minus ½-in., coke, as well as little extremely coarse coke in the tuyere zone.

Degradation Tests—Since coke is expected to remain intact during its descent in the furnace until it is consumed by oxygen of the blast

TABLE IV—BENEFICIAL EFFECT OF COKE BREEZE ON COKING COAL

Coal or Coal Blend	Fuel Index
100% washed Robena (3" x 0)	75
95% washed Robena (3" x 0) 5% coke breeze (1" x 0)	30
95% washed Robena (3" x 0) 5% coke breeze (20 mesh x 0)	100
100% washed Robena (80% -½")	105
95% washed Robena (80% -½") 5% coke breeze (20 mesh x 0)	130

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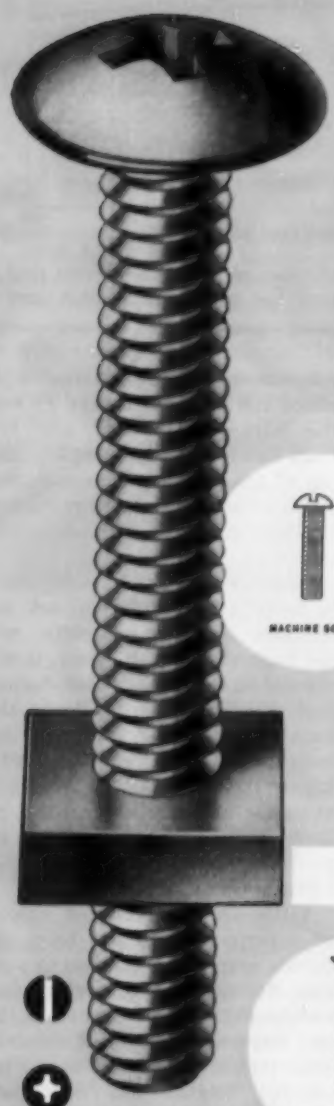

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at the tuyeres, one might naturally be led to the desirability of studying its resistance to degradation at elevated temperatures. Test equipment for studying degradation of coke both by abrasion and impact at temperatures up to 2500° F has been developed, and the results of high-temperature impact degradation tests are shown in Fig. 4.

It will be noted that different coke samples vary greatly in resistance to impact at high temperatures, with some cokes being as resistant at high temperatures as at room temperature. Of interest is the observation that Coke B and D, likewise Coke C and E, were made from the same coal blends; however, Coke B and C were produced with a 40-hour coking time, whereas Coke D and E were coked in a period of 17 to 18 hours.

Furthermore, the different coke samples do not show the same relative resistance to impact at room temperature as at 1500° F and at 2500° F. Sufficient information is not available to determine whether there is any correlation between high-temperature strength and blast-furnace performance.

Other Factors—It has long been known that the strength of coke made from high-volatile coal can

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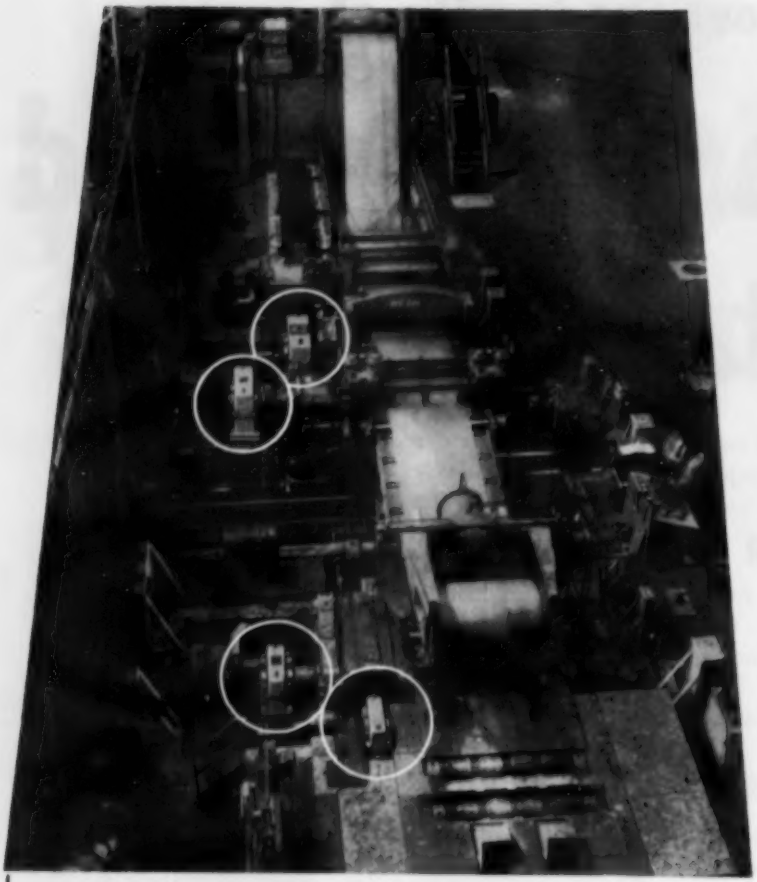

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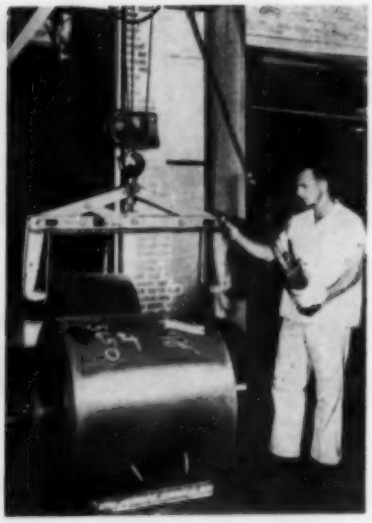

Tongs with Feather Touch

Using convenient push-button controls, an employee at Crown Coke & Seal Co., Baltimore, lowers Heppenstall automatic tongs over a coil of strip steel, preparatory to lifting it. The tongs will lift coils 31 in. wide and 36 in. in diameter, weighing 6600 lb each. The hairpin-shaped arms at the sides prevent the jaws from damaging the coil as tongs are raised or lowered

be increased by adding low-volatile coal to the mix as shown in Fig. 5. Generally speaking, the addition of low-volatile coal up to 10 per cent of the mix is beneficial, at which point the strengthening effect starts to level off and at 20 per cent there is little added benefit.

It will be noted that char and pitch are equally effective up to 10 per cent, at which point the effect of pitch drops decidedly and the char effect drops slightly.

Imparts Strength to Coke—As shown in Table IV, other so-called inert materials, such as coke breeze, increase the strength of coke made from high-volatile coal. It will be noted that when 5 per cent of coarse coke breeze is added to Robena coal, the strength is decreased; however, an addition of finer coke breeze (20 mesh x 0) increases the strength.

The beneficial effect upon coke strength of crushing the coal prior to blending also is shown. Furthermore, it can be shown that anthracite fines added to high-voltatile coal exert a strengthening effect.

Size Uniformity Vital—Blast-furnace operators and experimenters

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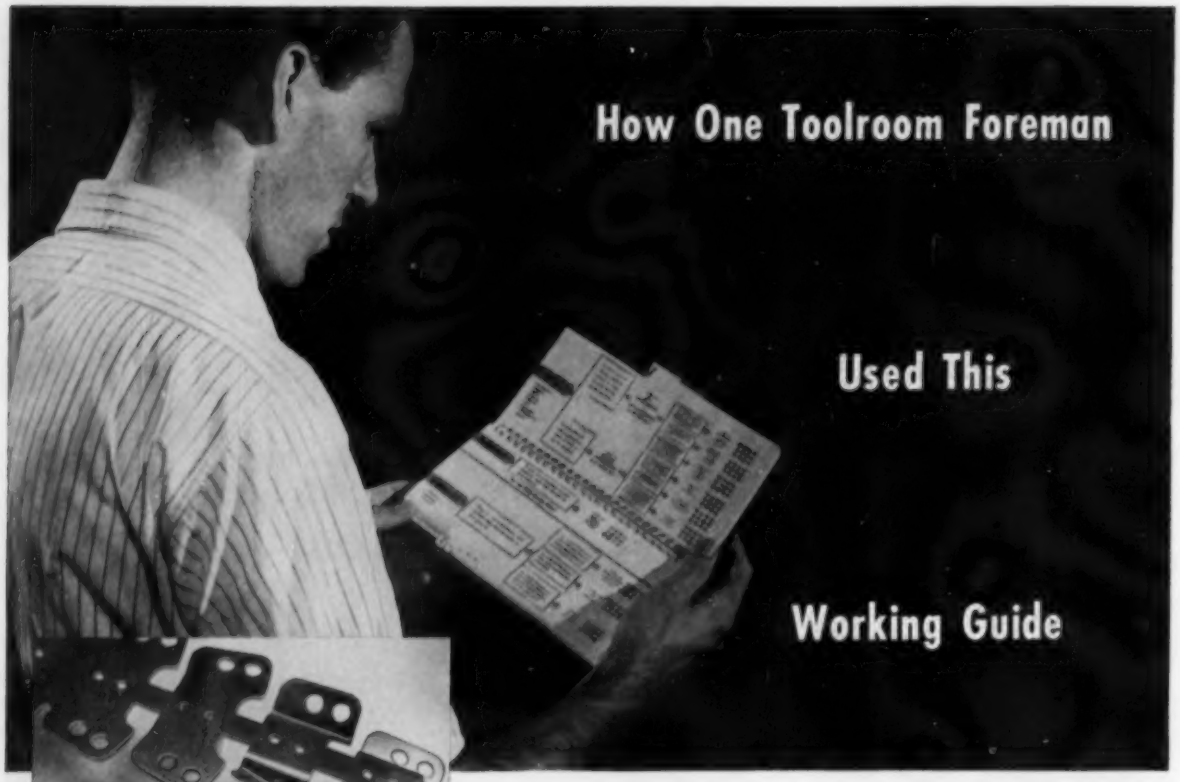

Job: Punch that blanks stampings from SAE 1010 strip, .062" thick.

Problem: The punch is so unbalanced in design that safety in hardening is vital. Also, the punch is shear fitted to the die, and hardening accuracy is necessary to avoid expensive adjustments after heat treating. Other die steels were tried, but they either broke or changed size too much.

Solution: At this point the Toolroom Foreman called in Carpenter and started to become more familiar with the Matched Tool and Die Steel Manual. The Manual pointed to Carpenter *Vega* (Air-Tough) Die Steel for the punch. Now they're coming through right on the nose. Moreover, production between grinds has jumped from about 10,000 to 50,000 stampings. And the Foreman says that from here on, all his tools and dies will be made from Carpenter Matched Tool and Die Steels. (Write for a more detailed Field Report on this job.)

. . . To Increase Tooling Productivity

This is for the man responsible for tools and dies who looks at a diemaking job with these thoughts:

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"How can I avoid costly *heat treating hazards?*"

"What can I do to *improve the job?*"

If you're that man, Carpenter wants to help. We offer you plain, *practical* help based on almost 70 years' experience working with other men who feel like you do.

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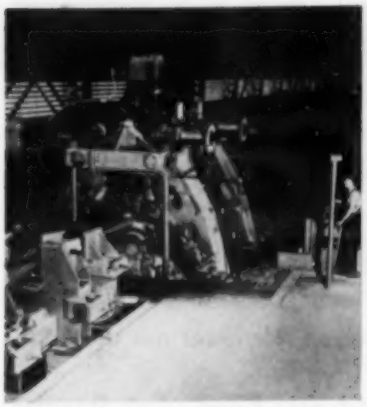


High-Speed Straightening

Accurate end-to-end straightening is achieved in the new pipe mill of Lone Star Wheel Co., Lone Star, Tex. A Sutton 7-roll straightening machine processes electric welded steel line pipe of from 4½-in. to 16-in. OD at production speeds of 60 to 300 fpm

are rapidly reaching a common opinion that perhaps the most important single quality of coke is uniform sizing. It almost goes without saying that coke fines will either be blown out with the ore fines as flue dust or descend with the charge and act similarly to ore fines promoting channeling; and coke that is too coarse will appear at the tuyeres and be slow to react. Much experimental work is necessary to establish ideal sizing for best over-all operation and lowest coke rate, but it is probably close to −3 in. and +1 in.

It is a not uncommon belief among operators that such properties of coke as porosity and void volume as well as cell size and structure are important for satisfactory combustion.

A property of coke which probably is a function of both structure and chemical composition is its reactivity, generally referred to as the rate of reaction of coke with one of the oxidizing gases, air, oxygen, steam or carbon dioxide. However, in a recent investigation it was found that in tests of a number of cokes of widely different physical and chemical characteristics made from coals of widely varying origins, the rates of reaction with carbon dioxide differed only slightly.

(Next week the author discusses details of the flux burden)

Norgren

Spray-Lube

System

ON TAPPING MACHINE

PRODUCED 4 COST-SAVING RESULTS for A-P CONTROLS CORP.

- **increased tap life**
- **increased tapping speed**
- **eliminated problems of chips plugging coolant lines**
- **eliminated messy condition of splashing coolant**

Write for Norgren Blueprint No. SL-4 and let your Norgren Sales Representative show you what Spray-Lube can do for you.

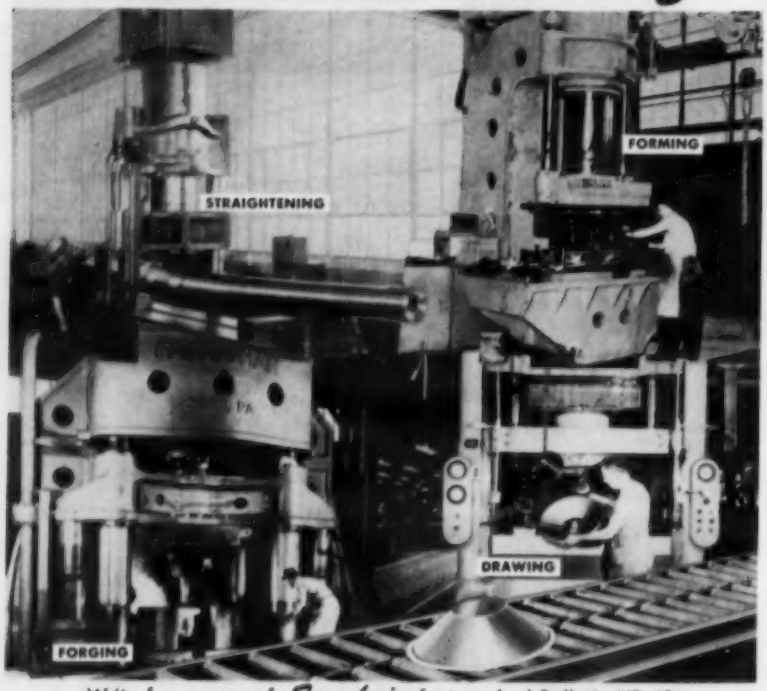
Machine taps 12 holes of various sizes simultaneously. Norgren Spray-Lube System includes 5 gal. tank, 12 mixing valves and spray nozzles. Air and fluid line pressures are 42 psi and 44 psi, respectively.

OIL FOG LUBRICATORS
PRESSURE REGULATORS
AIR FILTERS, VALVES
HOSE ASSEMBLIES

C. A. Norgren CO.
3412 So. Elati, Englewood, Colo.

Farquhar HYDRAULIC PRESSES

Eliminate Metal Cutting

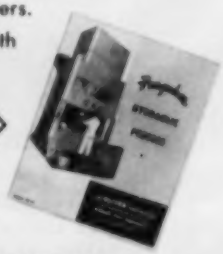


Write for a copy of *Farquhar's* fact-packed Bulletin HP-49

CHIP MAKING IS COSTLY

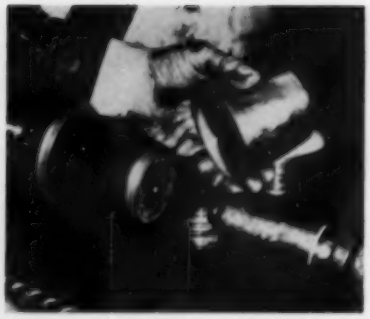
Metal formed to size and shape eliminates long costly machining operations. These are typical examples of the broad range of *Farquhar* presses that form metal to shape and eliminate costly metal-cutting. They're fast, sturdy, and efficient . . . a wise investment for cost-conscious manufacturers. Farquhar's engineers will be glad to work with you on your metal-forming problems.

WRITE TODAY ⟹
for a copy of Bulletin HP-49 covering a broad range of Farquhar Hydraulic Presses.



THE OLIVER CORPORATION — *Farquhar* — **A. B. FARQUHAR DIVISION**

THE OLIVER CORPORATION, 1522 Duke St., York, Pa.



When tolerances are close . . .

Plastic Forms Get Results

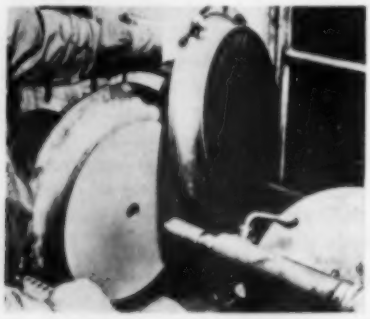
HERE's news for metal spinners. A die stock made from a paper-base laminate impregnated with Bakelite phenolic resins produces chucks easy to machine and low in cost.

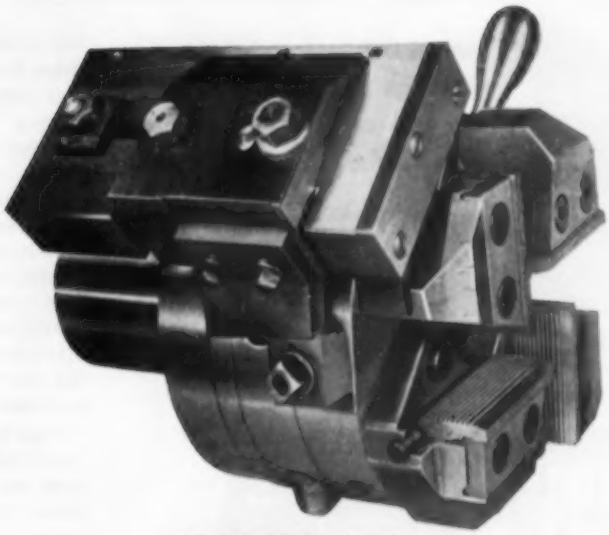
At Maryland Metal Spinning Co., Baltimore, these chucks are used to form the housing for a delicate, precision-made weather instrument (top photo). Spinning tolerances are close. Brass 0.040 in. thick is spun to a tolerance of minus zero, plus 0.007 in., on a diameter of 3.409 in. Inside diameter tolerances run plus 0.005 in., minus zero.

Forms Steel — Another chuck 2¾-in. thick, 29¼-in. in outside diameter, is used to spin a 17-gage cold-rolled steel ventilating ring with an inside flange 19½-in. in diameter for naval vessels.

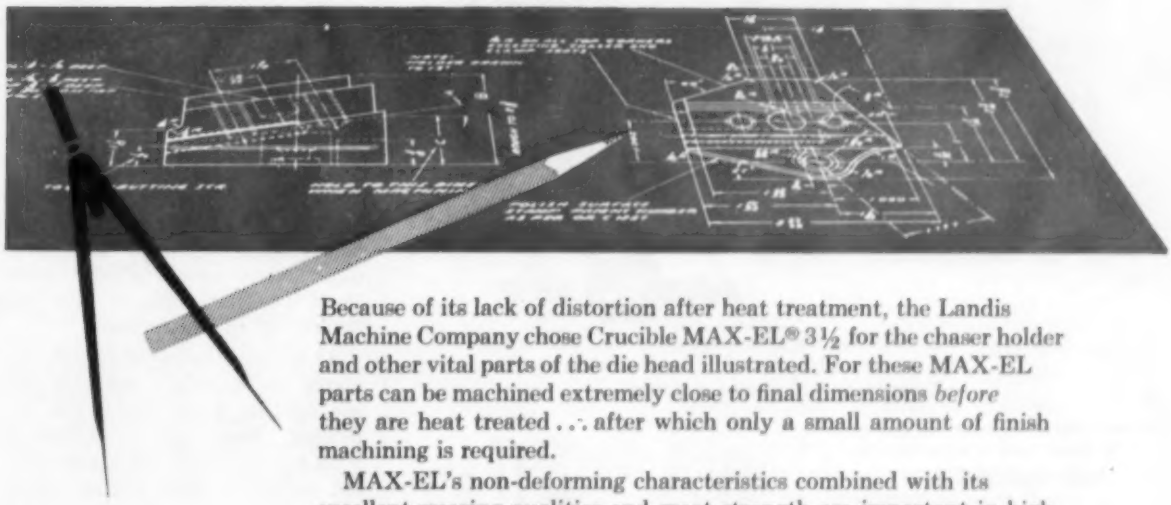
The die stock has a slick, smooth surface and is eight times stronger than hard maple in dent resistance, says the manufacturer, Formica Co., Cincinnati. These qualities also make the material valuable for producing pattern boards, gluing jigs, stretch forms and hydropress forms.

Plastic chuck forms ventilating ring





Non-deforming **MAX-EL** alloy steel parts require minimum finish machining



Because of its lack of distortion after heat treatment, the Landis Machine Company chose Crucible MAX-EL® 3½ for the chaser holder and other vital parts of the die head illustrated. For these MAX-EL parts can be machined extremely close to final dimensions *before* they are heat treated . . . after which only a small amount of finish machining is required.

MAX-EL's non-deforming characteristics combined with its excellent wearing qualities and great strength are important in high-speed turret lathe die heads . . . and in many other applications.

Your shop will benefit, too, from the ease of machining, freedom from distortion, superior quality and longer tool life you get with MAX-EL. To start taking advantage of MAX-EL *now, call Crucible.*

CRUCIBLE first name in special purpose steels

54 *years of* Fine *steelmaking* **ALLOY STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

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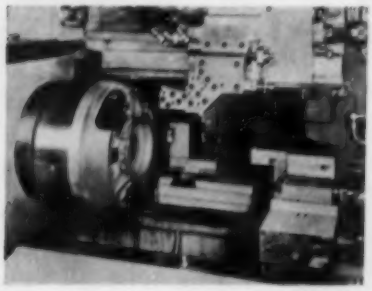


ONE-STEP ROUGHING, FINISHING
. . . at 160 parts per hour

Magnesium alloy jet engine housings are roughed and finished on the same automatic lathe

MAXIMUM utilization of tooling permits a single automatic lathe to be used for roughing and finishing of a cast magnesium alloy jet engine housing the plant of a major aircraft engine builder. The lathe, built by Hydra-Feed Machine Tool Corp., performs all cutting operations automatically, requiring only push-button actuation for clamp, feed start, and unclamp.

A specially designed finger chuck is used to hold the jet engine housing for machining. Three fingers on the hydraulically operated chuck grip the workpiece firmly without obstructing the movement of the tools or distorting the piece in either roughing or finishing.

Tool Costs Low—Tooling is identical for both machining cycles with the exception of a removable chamfer tool that is used only for finishing.

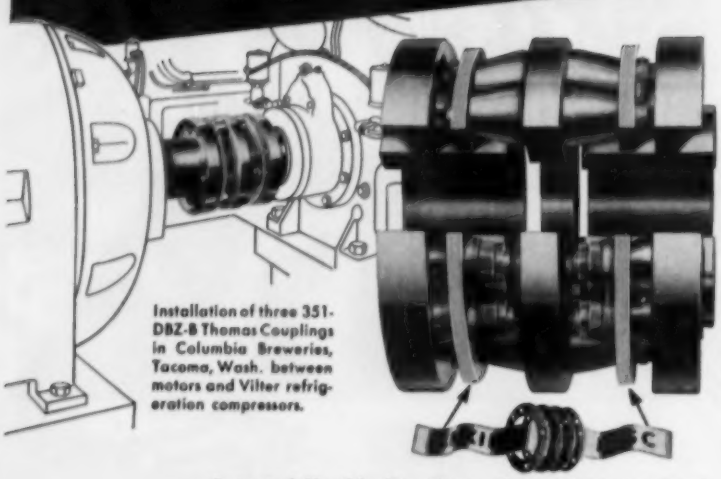
After the magnesium housing is hydraulically clamped in place to start the roughing cycle, the top and rear carriages rapid advance to start their cuts. Three tools are used on the top carriage to rough bore three different diameters. A longitudinally feeding tool on the rear carriage simultaneously turns the outside diameter.

Something Extra—An added feature on this setup is the use of the platen which is an optional feature on Hydra-Feed lathes. As the top and rear carriage rapid return to clear the workpiece, the platen slide equipped with four tools rapid advances and faces three external surfaces plus the bottom of the main bore.

At the completion of its cut, the platen automatically retracts and the spindle stops ready for unloading. The part is unclamped with a pushbutton and a new casting put in to start another cycle.

One Is Enough—This single machine maintains enough production to supply the engine builder's current production requirements while performing both roughing and finishing operations. After a bank of the magnesium housings are rough machined the machine is quickly converted for finish turning and a removable chamfering tool is added to the top carriage. The finish machining cycle is identical with roughing with the addition of the chamfering tool used to break the corner on the largest bore diameter.

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!



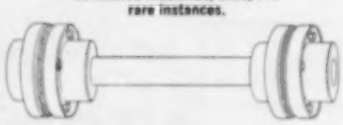
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.

Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.

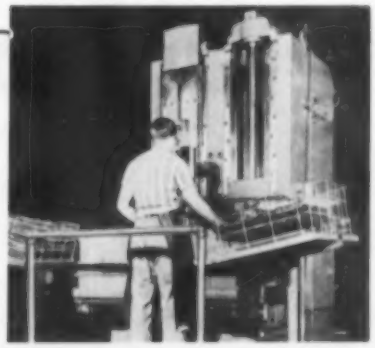


THOMAS

Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

Unique fixture permits multi-surface broaching on one part during a single machining cycle



MACHINE BROACHES THREE PLANES
. . . double tooling saves time

BROACHING three different surfaces on a part in three separate planes during one complete machining cycle not only requires a versatile broaching machine, but necessitates some unusual fixture and tool design. Producer of this particular part was a large automobile manufacturer.

Broached part is a transmission reverse band lever (see photo). The surfaces to be broached include the opposite sides of the lever boss, and an external V-shaped slot parallel to the axis of the same boss. Machine designers decided to straddle-broach both sides of the boss in one pass, and broach the 55-degree V-slot with a separate pass. To avoid tying up two machines and their operators, plus the extra handling time, a Colonial Model RT-10-54 was selected for this high production set-up.

Part Geometry—The critical part of the machining job involved locating the lever boss in its fixture so that the straddle-type broach would remove the same amount of material from both ends. Since the geometry of the part did not permit locating anywhere else on the part, except at the faces to be broached, the locating device or reference points had to be removable to allow the double-faced broach to straddle the boss during the cutting stroke.

Production Cycle—Sequence of operations starts with the operator placing the lever between the locating "fingers" for the straddle-broaching operation on the left ram and then clamping the part in place hydraulically. Next, the work platen with the fixture moves under the ram and the locating "fingers" are automatically drawn back from the part. At the same time, the right-hand platen shuttles back into loading position.

The left-hand ram completes its broaching stroke and the one on the right moves into broaching position. A part is placed in the right-hand fixture and hydraulically clamped in place for broaching the V-slot. The right-hand platen shuttles into broaching position, and the V-slot is broached as the left-hand ram positions itself for the next cycle.

Cowles Ty-Bond

the first new zinc phosphate coatings in twenty years!

Cowles TY-BONDS . . . amorphous and non-sludging . . . are *not* revisions of old-type coatings. They are completely new coatings—completely new formulations.

Cowles TY-BONDS form tight, hard, clean coatings . . . even the most severe bending, flexing or twisting cannot remove TY-BONDS. They cover the metal completely, no pin-points of metal are left unprotected. Old-type coatings leave as much as 60% exposed to corrosion!

Cowles TY-BONDS are economical because they are non-sludging. There is remarkably little waste . . . more than 90% goes into the surface treatment. TY-BONDS save time by reducing coating cycles and tank clean-outs, and meet all government specifications.

Your Cowles Technical Representative will be happy to give you complete information on the uses and applications of Cowles TY-BOND zinc phosphate coatings. Write or call today.

Cowles CHEMICAL COMPANY

7016 Euclid Ave. • Cleveland 3, Ohio

NEW SUTTON 7-Roll STRAIGHTENERS

FOR ACCURATE END TO END STRAIGHTENING
OF STEEL OR NON-FERROUS TUBES
OR ROUND BARS
AVAILABLE IN ALL SIZES
For 1/16" to 20" O.D. Tubes
For 9/16" to 12" Dia. Bars

MODEL 4 KTC (pictured)
TUBES FROM 3⅜" O.D. to 12" O.D.
BARS FROM 3⅜" to 7½" Dia.

Patented cluster roll arrangement positively confines work to pass line from entry to delivery without guides. Roll angles are automatically adjusted to proper setting with full contact between work and rolls.

Photo and diagram of 7-roll design shows engineering principle of cluster roll arrangement.

- TRULY GUIDELESS
- HIGH PRODUCTION
- QUALITY STRAIGHTENING

STRAIGHTENS
EXTERNAL UPSET
TUBING, CASING, DRILL PIPE
20 TO 50 TIMES FASTER!

Ask for Bulletin No. 25

SUTTON *Engineering* COMPANY

Manufacturers for Ferrous and Non-Ferrous Metal Industries

STRAIGHTENERS, EXTRUSION PRESSES, HYDRAULIC STRETCHERS,
SHEET LEVELLERS, GAG PRESSES, ROTARY CLEANERS,
HEAVY-DUTY UNIVERSAL JOINTS, ROLLS.

BELLEFONTE, PENNSYLVANIA

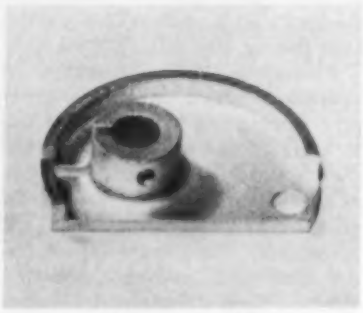
Saved: 86% on Part Cost

Stratos turned to investment castings and realized tremendous savings

CHANGE-OVER to investment casting for producing a cam used in an aircraft air conditioning valve cut costs on the part 86 per cent for Stratos Division, Fairchild Engine & Airplane Corp., New York.

Originally, the cam was formed from a two-piece assembly. Its main segment was of 4140 steel turned from bar stock and hardened to Rc 50. Its hub was of hard brass turned from bar stock and broached. Then the two pieces were riveted.

TWO-PIECE PART
. . . costly machining required

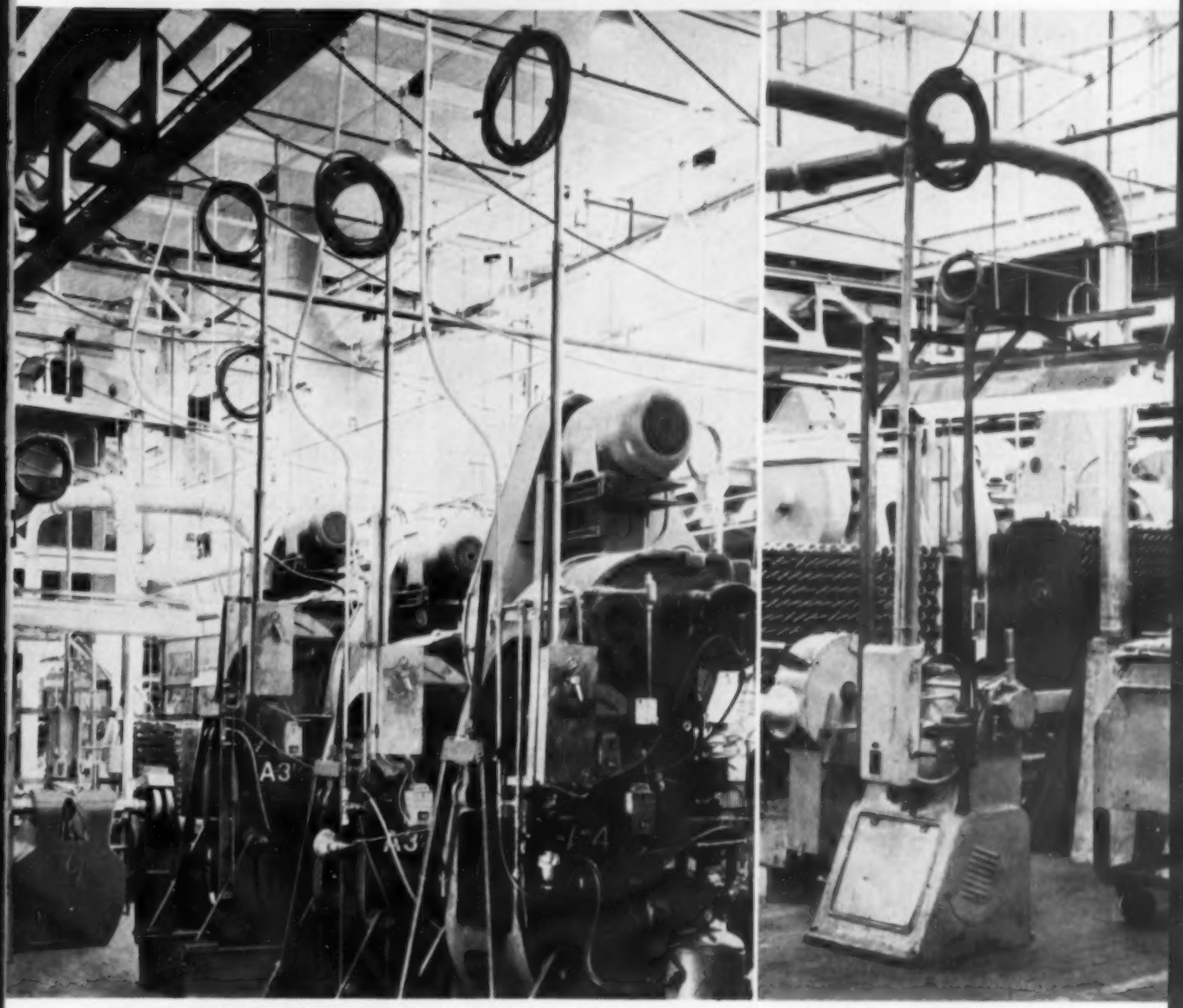


ONE-PIECE PART
. . . made by investment method

Costly—Much of the cost in producing the part came from the required machining operationa, plus assembling the two pieces.

The valve is now made for Stratos by National Precision Casting Corp., Clifton Heights, Pa. It is investment cast in one piece in 4140 steel. The cam area surface is hardened to Rc 50.

MODERN WIRING PAYS FOR ITSELF



Coils of Anaconda Powerduct cable (near ceiling) provide reserve footage for simple relocation of machines. This system greatly increases advantage of busduct, saving time and cost of moving rigid conduit.

Double the flexibility of your busduct with "plug-in" Powerduct Cable

Installing a modern busway system is only the *first* step in preparing your plant for speedy, economical relocation of machines.

Take full advantage of a really flexible busduct system: ANACONDA's *flexible* Powerduct® cable, which needs no rigid conduit to outlet, gives you maximum mobility . . . saves time and money.

Just plug in Powerduct cable at busduct and you're ready for production in seconds' time...and unplug it when you want to move machines. You save both the time and cost of removing and reinstalling conduit systems. And there's *100% salvage* of the cable on every move.

Two types are available—a rubber-loom-type, the only type approved by Underwriters — and plastic-type for oily and wet areas. Get Powerduct from your electrical Distributor; for more information, write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. A5303

®Reg. U. S. Pat. Off.

ANACONDA®
POWER CABLES

Unusual

IS THE WORD FOR THESE STAINLESS STEEL BLANKS . . .

Not Unusual

IN PRODUCTION AT . . .

No matter how you look at it, these heavy gauge Blanks are unusual.

Unusual because they are made of Type 302 stainless steel. Unusual because they are 5" thick x 7¾" ID x 78½" OD and weigh approximately 7000 pounds each. Unusual because each required special cutting and machining to produce its rough machined shape. But such jobs are *not unusual* at G. O. Carlson, Inc.

As specialists in working stainless steel, Carlson provides an unique service for you

. . . by having skilled workers produce your stainless shapes.

. . . by making full use of the specialized cutting and machining equipment at Carlson.

. . . by giving you exactly what you want "on time" to keep your production running smoothly.

. . . by eliminating shipping charges on material you cannot use.

Put your stainless steel plate requirements in good hands . . . that means, G. O. Carlson, Inc.

Stainless Steels Exclusively

G. O. CARLSON, INC.

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

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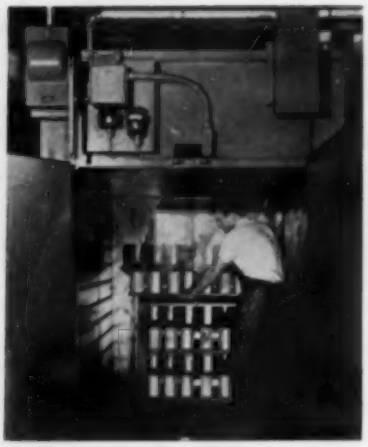


Flexible ovens need . . .

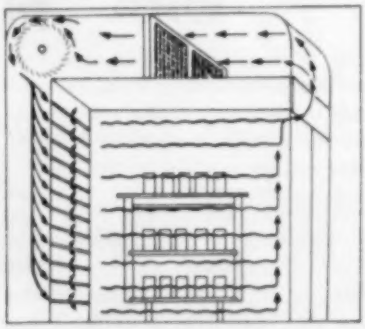
Sensitive Heat Control

INSTALLATION of electric duct heaters in a baking oven improved the quality of finish for a manufacturer of surgical instruments. Changing size of parts, paint formulas and other specifications made sensitive temperature control necessary.

Previously, a small oven was used to bake some parts, but larger pieces had to be air dried. This caused problems in handling and stacking. Storing parts with different drying times required a large amount of floor space. As a result production suffered.

The new oven will accommodate large and small units. Flexible heat controls — a thermostat with indicating dial, plus an upper-limit safety control — meet other variable requirements. Two Chromalox electric air blast heaters, rated 20 kw each, are installed in the air duct of the plenum chamber.

Parts are heated evenly as air circulates through heaters and disperses into heating chamber through louvers



OSWEGO, N.Y. U.S.A.

Logical Site For The Next Steel Plant

Best Location For Your Industry, Too

The twin development of the St. Lawrence Seaway and Labrador's vast iron ore deposits suddenly focuses attention on the lake-port *City of Oswego* as the nation's most logical location for the next steel mill.

A unique combination of other advantages makes *Oswego* an excellent location for any metal working industry.

We invite you to compare these advantages with any other city in your plans for expansion or re-location.

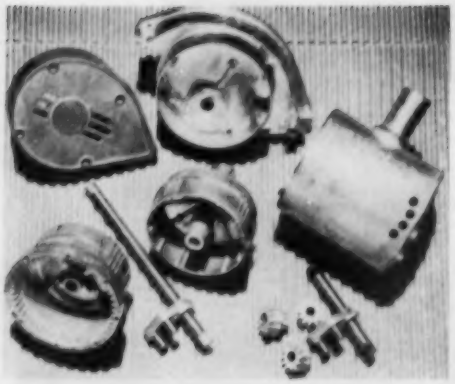
- **LABOR** An abundant supply of trained labor with a background of skills in foundry work, boiler making, castings, light metals and machinery.
- **TRANSPORTATION** Northern terminus of the New York State Barge Canal, nearness to the New York State Throughway, and three railroads make *Oswego* the hub of a great transportation network and offer the most economical choice or combination of transportation facilities. Completion of the St. Lawrence Seaway will make *Oswego* a world port.
- **MARKETS** *Oswego*, Great Lakes gateway to the Atlantic seaboard and the rich industrial Northeast, brings you to the threshold of the largest industrial and consumer markets.
- **POWER** A 400,000 kw. steam generating station right in *Oswego* provides a dependable part of the total 2,500,000 kw. capacity of the Niagara Mohawk system. This same utility provides natural gas for industrial use to plants in *Oswego*.
- **WATER** Unlimited supply of pure cold water from Lake Ontario.
- **SITES** Choice industrial sites available on or close to the harbor area.
- **COMMUNITY COOPERATION** *"Operation Oswego,"* community industrial development organization which has brought three new industries here in the past year offers the unlimited cooperation of the whole community to help you in your plant location plans. Write today for Operation Oswego's Confidential Brochure.

F. Hosmer Culkin, *Chairman*
Industrial & Commercial Relations Committee
CITY OF OSWEGO, Oswego, New York

We are interested in *Oswego* as a possible plant site. Without obligation and in complete confidence please send us your confidential brochure.

Name _____

Address _____



Die cast components for a lawn edger show smooth surfaces, cast-in precision and strength

Die Castings Carry

USE CZAP die castings—they're certified. That's the American Die Casting Institute's way of saying that zinc die castings produced by member companies under the Certified Zinc Alloy Plan (CZAP) have a rigidly controlled alloy content.

Institute members participate voluntarily under license in the program by submitting sample production castings to an independent testing laboratory. The institute enforces license provisions by unannounced pickups of samples.

Approval—Licensees are authorized to use the CZAP seal on their products—a guarantee that the castings meet ASTM chemical composition requirements.

Because zinc alloy castings exhibit their best qualities when alloy purity is rigidly maintained, a growing number of users are writing CZAP into specifications. A lawn mower manufacturer, and instrument maker and an automaker are examples:

Lawn Edger—In North Hollywood, Calif., Allegretti & Co. specifies certified zinc die castings for the housing and gears of lawn edgers, used for trimming lawn margin grass. Despite factors of impact and corrosion inherent in operation of the edger, a gear has never broken in service although some have worn out through constant use. Over a million units have been produced.

In designing the electrically motivated model-300 Rota Shear, Allegretti utilizes a chief advantage of die casting—cast-in close tolerances. Recesses of the ball-bearing housing require no machining to maintain alignment of bearings. Low production cost with precision, smooth surface finish, durability and corrosion resistance produce a quality product.

Instrument—To set multiturn devices such as helical potentiometers and variable capacitors, the Helipot Corp., division of Beckman Instruments Inc., South Pasadena, Calif., produces finely calibrated, close-tolerance Duodials.

Exhausts
and Tailpipes
...our Bread and Butter!
any kind of tube fabricating, our dish!
We cut our eyeteeth on them 27 years ago and they're still mighty important in our business. Since that time we've been performing just about every tube forming operation known to industry. And, if you're in a metal-working industry, chances are you can use to advantage our tube manufacturing and fabricating facilities and experience. Phone or write for helpful service.
FORMED TUBES, Inc.
204 Prairie, Sturgis, Mich.
Phone 681

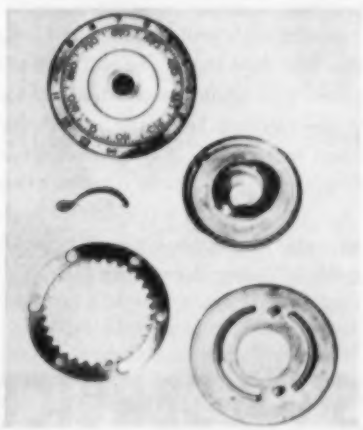
a Seal of Approval

These units, weighing about three ounces, register full turns and hundredths of a turn on two coaxial dials.

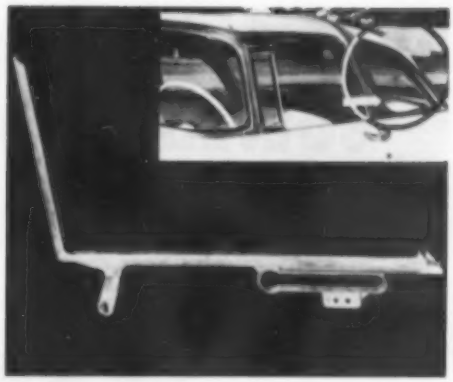
Critical components were redesigned as die castings because of substantial cost reductions compared to screw machine techniques formerly used. The Duodial housing is a certified casting with the numerals and calibrations cast-in; the secondary dial, also a certified casting, has an integrally cast internal gear. Result is a smooth working, attractive, competitive unit.

Window Frame—Sleek lines of the 1955 Ford hardtop are maintained in the channeled lower window quarter, redesigned as a one-piece certified zinc die casting. The 24½ x 13¼ in. part is cast in a highly polished single-cavity die with an unusually long slide that acts as the core to form the slot in which the glass rests. The casting is then chrome plated. In former models, this type component was assembled of welded rolled sections and steel stampings.

By changing to a die casting, Ford not only eliminated parts, but saved stamping, rolling, welding and assembling operations. Despite minor machining and polishing required for extra smooth surface finish, the die casting process permitted economies not possible with the assembled part.



Dial unit utilizes die cast components with cast-in numerals and calibrations



One-piece zinc die casting for Ford rear window eliminates stamping and fabricating cost

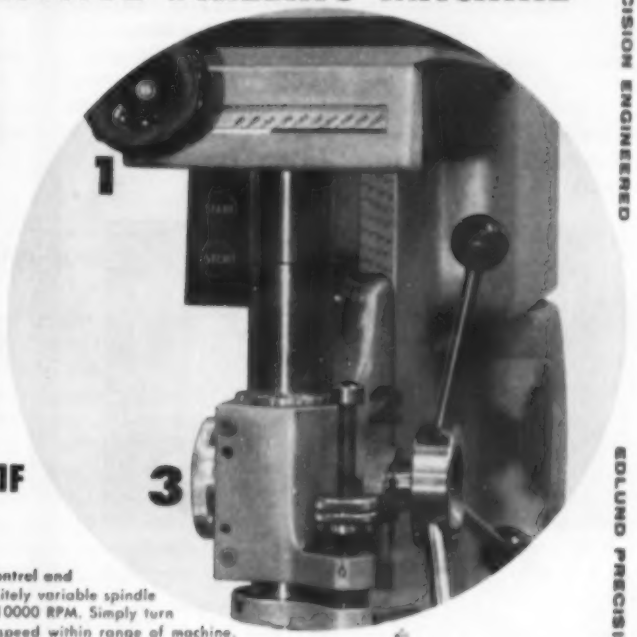
EDLUND PRECISION ENGINEERED EDLUND PRECISION ENGINEERED

new

SENSITIVE DRILLING MACHINE

EDLUND

Model 1F



1

Vari-Speed Control and Indicator Infinitely variable spindle speeds up to 10000 RPM. Simply turn knob for any speed within range of machine. Swift, Powerful, Positive Action.

2

Micrometer Graduated Depth Gauge Permits accurate prepositioned depth control for precision drilling. Clearly graduated to .001".

3

Adjustable Spindle Tension Control Compensates for weights of various drills. Three-handle feed lever lets operator choose best feeding position.

Specifications

Overhang ..... 7"
Capacity (Cast Iron) ..... ½"
#1 Morse Taper or Jacobs Chuck ... 0-½"
Speed Range—Optional ....
635 to 5000 RPM
1250 to 10000 RPM
Pedestal or Bench Models

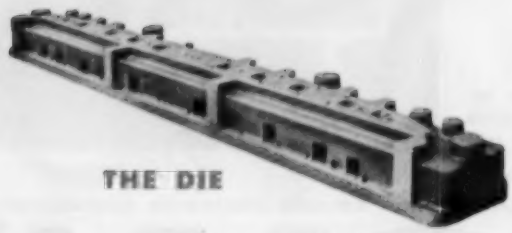
Send for Free Illustrated Bulletin #160

EDLUND MACHINERY CO.
Division Bradley-Edlund Corp. Cortland, N. Y.

EDLUND PRECISION ENGINEERED

Affiliated with Precision Castings Co., Inc., Edlund Representatives in Major Cities

AT NEMCO FOUNDRY: ANOTHER PROBLEM SOLVED BY CITIES SERVICE CORE OIL



THE DIE

The die pictured here was cast at Nemco Foundry for use by the Spartan Aircraft Company in producing roof ribs for its Spartan Mobile Home. Difficult to produce, it required 10 cores 2⅝" x 2⅝" square and 25 cores, quarter-circle in shape, from ¾" to 1" in diameter. Semi-circular shape was necessary to core curved slots from top of die to sides. Holes had to be clean and free from obstruction, allowing stamped slugs to fall through. Nemco relied on Cities Service Delco Core Oil to help meet exact specifications. "A smart choice," says J. A. Dean, General Manager. "Delco Core Oil made the job far easier."

THE ROOF RIBS

The roof ribs of this Spartan trailer, cast from the die produced at Nemco, are visual proof of a job well done. "The great strength and high collapsibility of Cities Service Delco Core Oil share a lot of the credit," says Nemco.

THE FINISHED PRODUCT

The finished product is this handsome Spartan Mobile Home awaiting shipment to consumer. Spartan's rigid specifications help make it one of the safest and best on the market.

Difficult casting of die to form roof ribs for Spartan Mobile Home made easier by Cities Service Delco #36

Located in Tulsa, Oklahoma, Nemco Foundry enjoys attacking the really tough jobs and making them easier. And often helping to spearhead the attack is Cities Service, as described here by J. A. Dean, General Manager:

"Recently Cities Service Delco #36 Core Oil again solved a tough job for us in fulfilling the requirements for a casting for the Spartan Aircraft Company, makers of Spartan Mobile Homes. The casting was a bottom shoe for blanking die to make roof ribs for the all-aluminum shells for Spartan trailers.

"The die was of Nemcoloy, Type AL, an alloyed grey iron. It was 106" long, 8" thick and 13½" wide, and weighed 2,018 lbs. cleaned.

"It required 10 cores 2⅝" x 2⅝" square. In addition, it demanded 25 cores, quarter-circle in shape, ranging from ¾" to 1" in diameter. Semi-circular design was necessary in order to core curved slots from the top of the die to the sides of the die. Holes had to be clean and free of obstructions allowing the stamped slugs to fall through the die to the outside and not hang up.

"Cities Service Delco #36 Core Oil enabled us to meet these requirements perfectly. We certainly recommend it where great strength and high collapsibility are needed."

Like Nemco, scores of other foundries have reported unusual results with problem-solving Cities Service Core Oils. Nor does the praise end with the product . . . for time and again the solution for the proper core oil has resulted from the knowledge, understanding and experience of a Cities Service Lubrication Engineer. If you have a lubrication problem, why not talk it over with one of these Cities Service experts? Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

NEW PRODUCTS and equipment

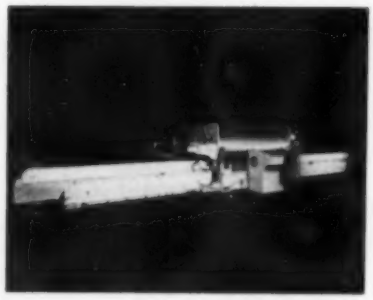
Write directly to the company for more information

Shell, Tube Heat Exchangers Serve for Cooling Applications

Four standard models were used in one application to maintain an acid bath temperature at 25° F. The units were insulated with core to minimize heat gain from the room through the exchanger shells. Rubber-lined piping connected the exchangers to the holding tank. This piping was cork insulated.

Less cooling surface area was required. A higher transfer rate, coupled with high coefficient of heat transfer, enabled the reduced area of exchanger surface to adequately handle the cooling requirement. The units used in this case afford corrosion resistance for most acid services. They can be modified for special applications. Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11, O.

Press Offers Rubber-pad Forming Techniques



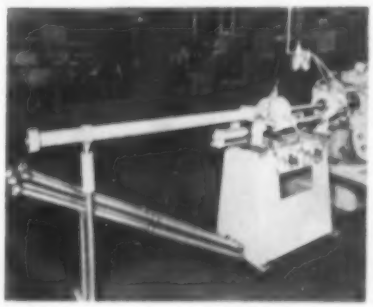
Two models in production are of 10,800 and 19,500-ton capacity. When hydraulic fluid is pumped into the diaphragm (positioned over a rubber pad), pressure is exerted on the pliable rubber pad and forces it down over the form blocks. After forming, the oil is pumped from the diaphragm and the sliding table containing the formed parts is removed from the press.

The Diaform press features two reciprocating tables that operate alternately from each side of the pressure housing. They are actuated laterally by a fluid motor drive through a dual-chain conveyor to position stops. The table top of the press is flat and raised into the pressure retainer during the forming cycle. There are no restrictions on the placement of forming blocks, if they are of different heights. The press is completely hydraulic. Hydraulic Press Mfg. Co., Mount Gilead, O.

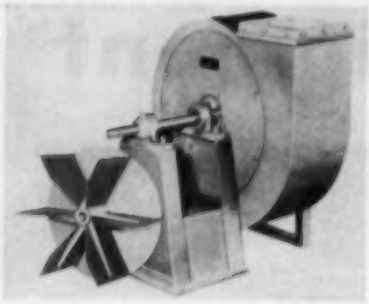
Automatic Air Stock Feed and Collet Operating Unit

This unit automatically feeds bar, hex or tubing stock to a machine. It feeds for any mechanism rotating or nonrotating and is designed to operate with any type of collet equipment. It consists of three main assemblies: Stock tube, filler tubes and stock tube support; air-operated feed chuck and feed chuck base; an Erickson heavy-duty, high-rpm rotating air cylinder of "donut" design. Stock up to 2⅝-in. in diameter can be accommodated. Feed length is adjustable from 0 to 15 in. One valve controls the entire operation.

Ruggedly designed of welded construction, both the tube support and feed chuck base are adjustable for height at setup. Standard stock tube lengths are 6 and 12 ft. Special tubes can be furnished. Erickson Tool Co., E. 23rd and Hamilton, Cleveland 14, O.



Completely New Line of Industrial Fans



The new line offers proportions conforming to the latest NAFM standards and an increased range of 14 standard sizes. A choice of wheel types is offered to adapt to specific applications. All-welded steel housings and wheels are used.

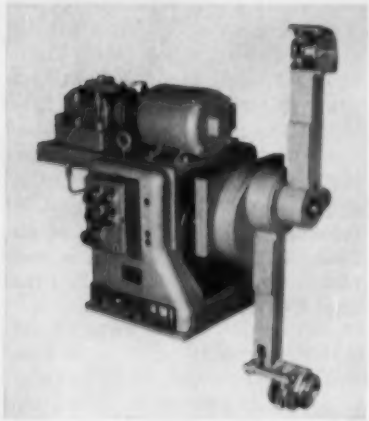
With the complete line of accessories and modifications, these fans are adaptable to virtually any type of fume, materials handling or high-temperature application. The fans are particularly designed to provide maximum serviceability under the corrosive and abrasive conditions found in industrial exhaust service. Data are offered to simplify the process of determining the best fan size for a given capacity and pressure required. Bayley Blower Co., 1817 S. 66th St., Milwaukee 14, Wis.

Rip-cord Opener for Steel Strapping Coils

The Rip-Cord opener for packaged light-duty steel strapping, operates like the easy-to-open cigaret and chewing-gum packages. Strapping coils are ready for use in less than 10 seconds. Opening packaged coils formerly took up to 5 minutes.

The new opener is standard on all packaged coils of Allegheny steel strapping. Allegheny Steel Band Co., Box 716, Pittsburgh 30, Pa.

Loader Automates Existing Production Equipment



The loader for machine tools is particularly adaptable for use with horizontal spindle machines, such as lathes and grinders. It is compact and may be used where space limitations have previously eliminated the possibility of loading automatically. The loader feeds a part to the machine from an incoming conveyor or preceding machine. It simultaneously removes finished parts from the machine to an outgoing conveyor.

Pneumatic cylinders in the arms open and close the work clamps. A cam-actuated mechanism moving on preloaded ball-bearing slides moves the arms and turns and lifts the central hub. The cams are powered by an electric motor. The clutch and brake are controlled by limit switches. The loader may be mounted on its own heavy cast base or directly on the machine or conveyor in any position. The loader box requires a space of 16 x 16 x 32 in. Hautau Engineering Co., 721 Wanda, Ferndale 20, Mich.

Dresser Cutter for Sharpening Abrasive Discs

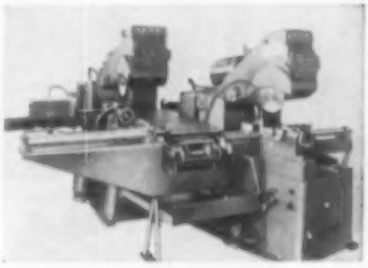
The Wise Type's "fingers" pick abrasive grain from the surface of grinding discs. This action sharpens the disc without changing its grinding characteristics. The pick-out teeth require less pressure on the disc for sharpening and last longer because friction is reduced. A square arbor holds the cutter in place, with the teeth in staggered position. Chewing of the arbor spindle is prevented.

Sealed ball bearings hold the square arbor. Buttons are pressed into the side of each cutter (six make a complete dresser cutter assembly). The cutter is interchangeable with previous ones used on Besly grinders. Besly-Welles Corp., Beloit, Wis.

Two Standard Machines Combine To Do a Special Job

The machines illustrated are the model OOG automatic circular sawing machines. The machine in the rear cuts a piece from stock twice the finished length to provide square ends. The front machine, positioned at the 15 degree angle, is equipped with angular jaws on a double-acting, self-equalizing vise. By cutting the piece in half, the part has a 15 degree angle at one end and a 90 degree angle at the opposite end.

Stock is fed automatically to the machines. A stock stop actuates the vise on each machine and gages lengths to be cut on the respective machines. The sawing cycle begins as soon as the vise has clamped the stock. Motch & Merryweather Machinery Co., 888 E. 70th St., Cleveland 3, O.



Sensitive Drilling Machine Is Cost Cutter

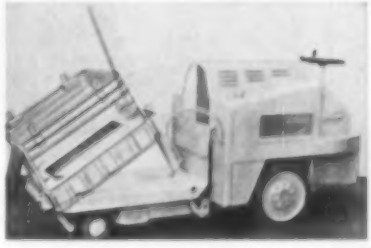
Heart of the 1F's cost cutting ability is the vari-speed drive, a variable diameter V-pulley system which delivers smooth, instantly variable speed action without changing belts or gears or stopping the machine. A control knob makes speed changes. The spindle speed (1250 to 10,000 rpm) is visible through a speed indicator window next to the control knob.

A micrometer graduated depth gage (0.001 in.) on the sliding arm permits predetermined depth settings. The spindle tension control is adjustable for sensitivities and weights of different tools. The 1F is available in pedestal and bench models, with combinations of one to six spindles for special job applications (particularly those requiring several operations of a small, high speed, sensitive nature). Optional speed range from 625 to 5000 rpm is also available. Edlund Machinery Co., division, Bradley-Edlund Corp., Cortland, N. Y.

Attachment for Automatic End Dumping of Skid Boxes

The attachment can be used with both electric and gas-powered trucks, with capacities of 4000, 6000 and 10,000 lb and larger. Loading and dumping operations are automatic. Hydraulically powered, it is especially desirable for movement of scrap, castings, forgings, wood pulp, cullet and materials in skid boxes or racks. It permits dumping these materials, for example, into below-floor bins or onto the floor of freight cars or street trucks.

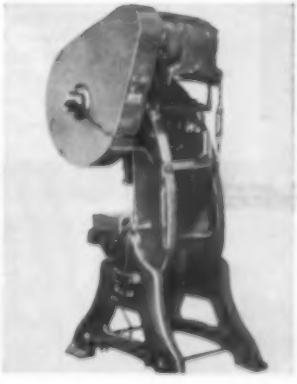
The unit is illustrated on a 6000-lb capacity model-GEP-6 gas-powered low-lift platform truck. Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, O.

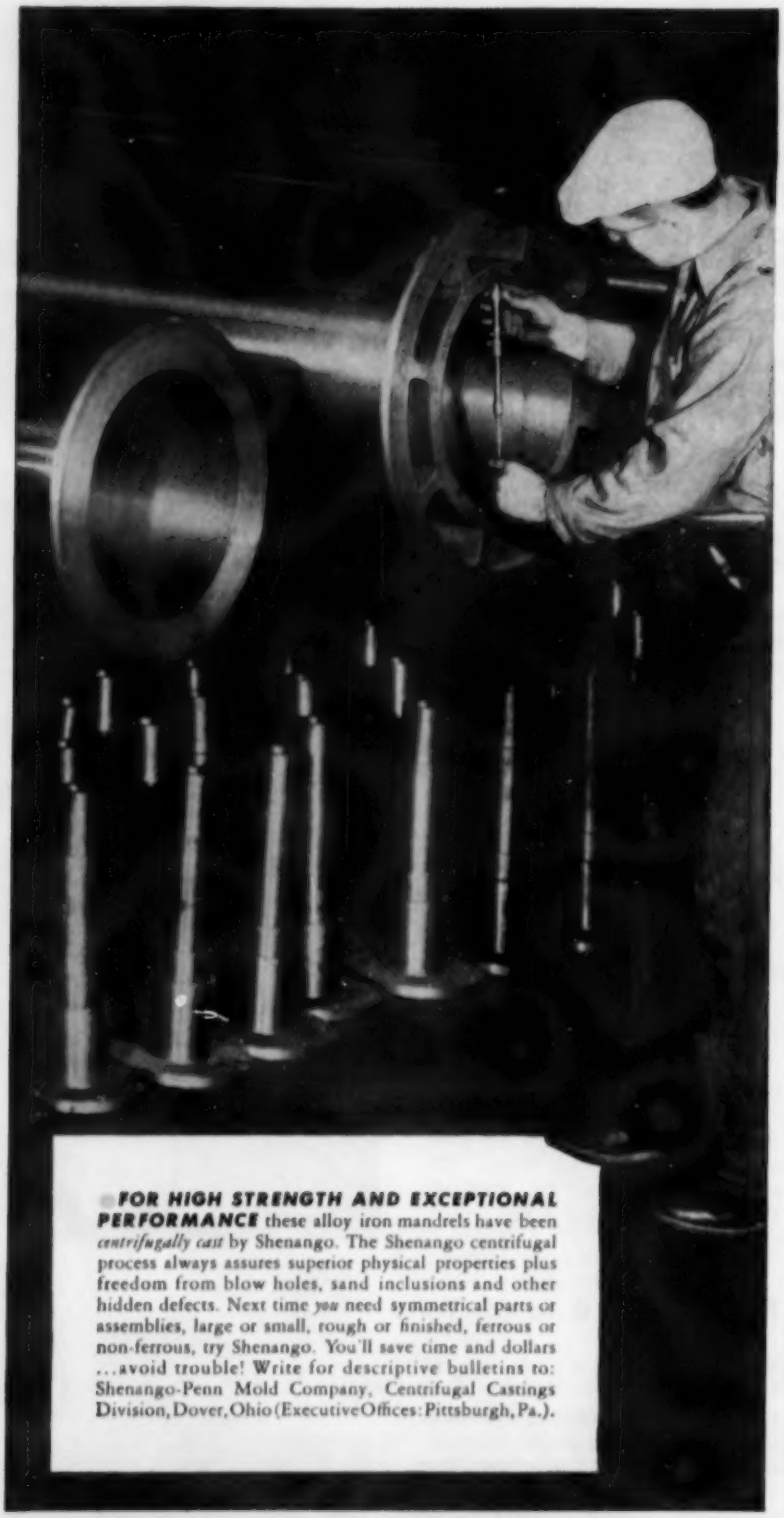


System for Inclinable Punch Presses from 6 to 65 Tons

The packaged Hi-Flex system includes a variable speed drive high-speed, mechanical on - off brake and automatic lubrication system. With the system, its presses may be operated at a variable and extended range of speeds. Speed changes may be made while the press is in operation, allowing a fine adjustment for the best production from a given die.

The brake will stop the press at the completion of a cycle even at the highest speed. Low maintenance at high operating speeds is assured by the automatic lubricating component of the system. The Hi-Flex system is available on the company's presses (from 6 to 65 tons) or may be installed as a packaged system. Walsh Press & Die Co., division, American Gage & Machine Co., 4709 W. Kinzie St., Chicago 44, Ill.

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NEW Literature

Write directly to the company for a copy

Disc Grinder

Details on the bench-mounted double-end disc grinder, which simultaneously grinds both ends of compression springs, are offered—Carlson Co., 277 Broadway, New York 7, N. Y.

Gages

This is a complete listing of this company's balanced action gages. Net prices are included—20 pages. Winter Bros. Co., division, National Twist Drill & Tool Co., Rochester, Mich.

Nonferrous Forgings

A forgings catalog and engineer's handbook illustrates the various types of forgings the firm produces. Forging data are included. Scovill Mfg. Co., Forgings Div., Waterbury 20, Conn.

Solvent

Information on Chlorothene (Dow Inhibited 1, 1, 1-Trichloroethane), a cold degreasing solvent, is available. Dow Chemical Co., Midland, Mich.

Compressors

"Nonportable Compressors" (an installation and maintenance guide) covers such subjects as location, foundation-shaking forces, soil considerations, piping and temperatures—RP-725, 6 pages, Worthington Corp., Harrison, N. J.

Digital Converters

The Digi-Coder digital converter (electro-mechanical shaft position types and voltage types) are described—catalog 58-10, 12 pages. Fischer & Porter Co., 302 Jacksonville Rd., Hatboro, Pa.

Sheet Metal Machinery

Every type sheet metal machinery is detailed. Diagrams, charts and tables are included—142 pages. Federal Machinery Co., 134 Grand St., New York 13, N. Y.

Copper Specs

Copper and copper-alloy specifications (ASTM, ASME, AWS, SAE, AMS, federal, military, Army, Navy and Army-Navy) are offered—B-34R, 24-pages. American Brass Co., Waterbury 20, Conn.

Product Catalog

Essential facts on P&H overhead cranes, electric and chain hoists, arc welders, welding electrodes, welding positioners, truck cranes, power shov-

SAVES $5,000 YEARLY ON STEEL COST

Unloading Time Cut 2 Hours Per Railroad Car

5-ton, 3-runway, 50-ft. span, completely motorized Cleveland Tramrail bridge operated by pushbuttons from floor. Bridge is shown interlocked with track extending out doorway over railroad. This Tramrail system has been in service since 1943.

A handsome dividend is being earned by the Kortick Manufacturing Co., San Francisco, Calif., on its Tramrail transfer bridge installation.

Because the bridge is of 5 tons capacity, the rods, bars and angle iron which Kortick uses for the manufacture of pole line hardware, can be bought and handled in 5-ton bundles. This eliminates a bundling charge made for smaller bundles. The savings is $2.00 per ton. As Kortick takes in an average of 200 tons per month, the monthly saving amounts to $400.

The bridge interlocks with an outside Tramrail track that extends over a railroad track. This enables the hoist carrier to deliver steel directly from railroad cars to any point inside the building served by the bridge. Because of this feature and the fact that heavier bundles are handled, a saving of about 2 hours unloading time is made per 50-ton car of steel, over their former method which employed a 3-ton hoist.

Obviously with total savings running in the neighborhood of $5,000 yearly, it did not take long for this Tramrail installation to pay for itself.

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THE CLEVELAND CRANE & ENGINEERING CO.
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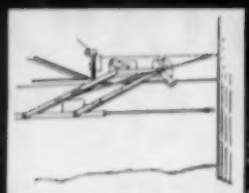
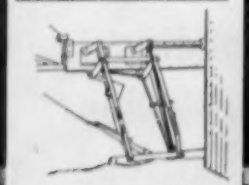
CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Bailey
Cinder Notch Stopper



Stopper in "out" position.



Position after cinder notch has been closed.

keeps workmen out of a danger zone

Since the Bailey Stopper is controlled remotely, no workman need approach the cinder notch—assuring safe, dependable closing every time. Gravity action inserts the bott in the monkey, and an air or steam powered cylinder withdraws the stopper to the "out" position. Design is such that alignment is true at all times. For durability, both the bott and rod are water-cooled.

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
1221 BANKSVILLE ROAD PITTSBURGH 16, PA

NEW LITERATURE

els, electric shovels, soil stabilizers and diesel engines are given—bulletin G-15. Harnischfeger Corp., 4616 W. National Ave., Milwaukee 46, Wis.

Aluminum

A complete wrought aluminum alloy selection guide outlines properties of various aluminum mill products and lists their applications. A casting alloy selection guide is included—16 pages. Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.

Milling, Grinding

The model 104 template and cam machines for external and internal contour grinding or milling are covered—4 Pages. Pratt & Whitney, division, Niles-Bement-Pond Co., West Hartford 1, Conn.

Graphite's Significance

The growing significance of graphite in electro-metallurgy and electrochemistry is outlined in "Engineered Performance." Electrode Division, Great Lakes Carbon Corp., 18 E. 48 St., New York 17, N. Y.

Plant Facilities

"Facts About Air Reduction" describes the products and services of its divisions—34 pages. Air Reduction Co. Inc., Lincoln Bldg., 60 E. 42nd St., New York 17, N. Y.

Demineralizing

Various methods of water treatment, as well as a comparison between demineralizers and evaporators are covered in "Handbook on Demineralizing"—publication 5800-B. Cochrane Corp., 3130 N. 17th, Philadelphia, Pa.

Oxygen Steelmaking

"Oxygen Steelmaking in the United States" briefly goes into the plant, the process and its economics—12 pages. Henry J. Kaiser Co., Kaiser Bldg., Oakland 12, Calif.

Angle Comparator

The construction and operation of the Angle Comparator (a precision optical instrument for quality control in machine shops and metalworking departments) is described—8 pages. Perkin-Elmer Corp., Norwalk, Conn.

Warehousing

"How to Double Your Warehouse Capacity" shows that sizable savings in space and time are nearly always possible through better use of existing facilities and, where advisable, through use of special stor-

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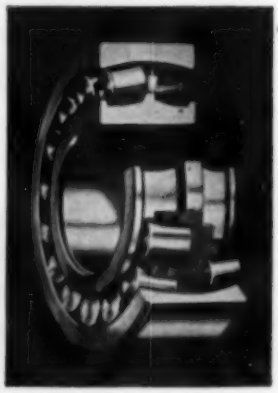

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NEW LITERATURE

age equipment—Catalog No. 700, 15 pages. Frick-Gallagher Mfg. Co., Wellston, Ohio.

Phosphor-bronze

Thin-gage, high-precision tolerance strips of phosphor-bronze are detailed. Physical characteristics, temper, mill limits, available thickness tolerances and applications are given —Technical Data Sheet No. 101. American Silver Co. Inc., 36-07 Prince St., Flushing 54, N. Y.

EDITORIAL REPRINTS:

Write Readers' Service, STEEL, Penton Bldg., Cleveland 13, O.

Product Communication

You can add certainty to the sales destiny of your company if you know how to tell the market about your product, advises No. 1 in STEEL's new Program for Management series on p. 73. The article covers the effective use of the media of sales promotion, how to integrate production, sales and sales promotion objectives, how to measure results.

Powdered Metal Gears

Gears made of prealloyed steel powder are guaranteed to equal or surpass the performance of machined ones. The powder is said to improve the strength, toughness and wear resistance in the same proportion as 4650 alloy steel has advantages over carbon steel. On p. 84, you'll find a description of Keystone's production methods.

Blast Furnace

Use of greater amounts of sinter in the ore burden has been found to lead to higher output of metal and lower coke consumption. Correspondingly, there is a decrease in the quantity of flue dust. Part II of this article begins on p. 92.

Taxation

Intra and interstate tax laws need revamping. Examples show how only a legal mind can understand the maze of confusing local tax laws facing management today, p. 44.

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2-Piece Cut Assembly 40¢ (Combination spur and helical gear.) Powdermet* Part 8¢

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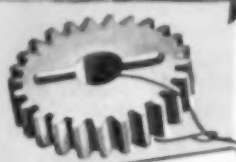

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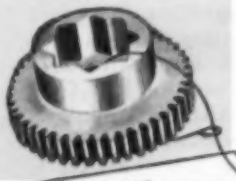

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ADDRESS DEPT. S-62

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STEEL
February 14, 1955

Market Outlook

IT'S TIME to look into this year's second half —the period which many analysts are still shying away from. (The auto industry's welfare is keeping them guessing.)

The second half ought to bring pretty good business to the steel market, despite what may happen in the auto industry. It has been commonly assumed that the auto producers are trying to pack as much of their 1955 production in the first five months as possible. After that, what?

SAFETY ZONE—The steel ingot production rate is high enough now that it could lose several points and still be pretty good. In the week ended Feb. 13 the rate was 88 per cent of capacity.

Annually, the auto industry uses about one-fifth of the nation's steel, but right now it's probably taking somewhat more than that. So, at least 17 points (and maybe a few more) of the current ingot rate stem from automotive demand. If you subtract those 17 points from the present rate, you have a 71-point rate. And that is several points higher than the rate in many weeks of last year. Of course, if the auto industry dropped completely out of the market for steel for a long time the effects would be so widespread that other steel consumers would need less steel, too. And the steel rate would drop by more than what the auto industry cut.

GAGING THE IMPACT—It's not likely, however, that the auto industry would be out of the steel market for long. If anything, the auto industry would only reduce its take. If the auto industry were to cut its steel purchases by half, it would knock only nine or ten points out of the current steel rate. That would leave a rate of around 78 per cent of capacity.

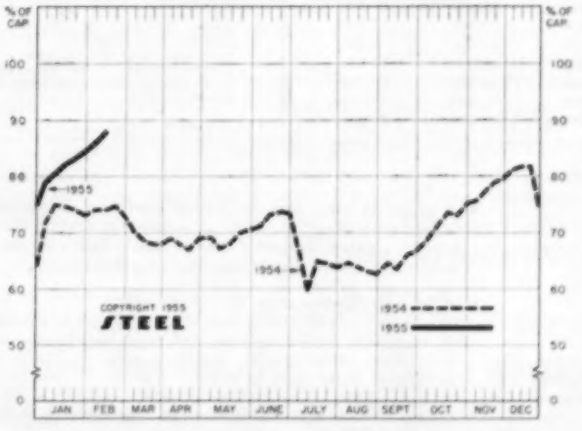
REFUTATION—Maybe there won't be much of a drop in the automotive industry's steel demand. Harlow H. Curtice, president, General Motors Corp., says that "at no time have we had in mind to provide inventory against a possible work interruption."

Even if auto demand for steel slows down, there are other consuming groups that will make seasonal increases. Construction is one.

PICKING UP—Already there's a sign of pickup in some of the materials the construction industry uses. Inland Steel Co. lengthened deliveries about a week on sheared and universal mill plates. Structural shape schedules are tightening, too, for in addition to a sustained domestic demand there is increased call from abroad. Foreign demand, not only for shapes, but for other forms of steel is a widening support for our steel business.

TIGHT SPOT—Area where demand is tightening noticeably is Chicago. Even warehouse business is improving there. Until now, warehouses have not experienced as much pickup as mills. In the Chicago district, some mills are booked solid for the first half of this year on cold-rolled carbon steel sheets and galvanized sheets. Orders for hot-rolled carbon sheets have risen, and deliveries have lengthened. Also experiencing an upturn at Chicago are bars—carbon and alloy and hot-rolled and cold-finished.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Feb. 13	Change	Same Week 1954	Same Week 1953
Pittsburgh	95	+ 3*	86.5	106
Chicago	91	+ 3*	81.5	101
Mid-Atlantic	86	+ 1	75	97
Youngstown	89	+ 1	63	106
Wheeling	95.5	0	75	100.5
Cleveland	94.5	+ 7.5*	80.5	103
Buffalo	100	0	83	106.5
Birmingham	79	0	76.5	97
New England	79	0	53	85
Cincinnati	90.5	+ 2.5	73.5	93
St. Louis	96.5	— 2.5	35.5	93.5
Detroit	84.5	— 7	80.5	100.5
Western	87	+ 1	71	109
National Rate	88	+ 2	74	99.5

INGOT PRODUCTION‡

	Week Ended Feb. 13	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	131.4†	128.9	124.9	110.4
NET TONS (In thousands)	2,110†	2,070	2,007	1,774

Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 27 Technical Outlook—p. 83

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Feb. 8 1965	Feb. 1 1965	Month Ago	Jan. Average
(1947-1949=100)	144.7	144.7	144.6	144.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Feb. 8

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.525
Rails, light, 40 lb	5.917
Tie Plates	5.275
Axles, railway	7.500
Wheels, freight car, 33 in. (per wheel)	48.500
Plates, carbon	4.675
Structural Shapes	4.517
Bars, tool steel, carbon (lb)	0.430
Bars, tool steel, alloy, oil hardening die (lb)	0.525
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.115
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., alloy	5.875
Bars, H.R., stainless, 303 (lb)	0.422
Bars, H.R., carbon	5.000
Bars, reinforcing	4.963
Bars, C.F., carbon	5.160
Bars, C.F., alloy	11.375
Bars, C.F., Stainless, 302 (lb)	0.438
Sheets, H.R., carbon	4.870
Sheets, C.R., carbon	5.564
Sheets, galvanized	7.220
Sheets, C.R., stainless, 302 (lb)	0.553
Sheets, electrical	$9.350
Strip, C.R., carbon	7.493
Strip, C.R., stainless, 430 (lb)	0.415
Strip, H.R., carbon	5.113
Pipe, black, buttweld (100 ft)	15.000
Pipe, galv. buttweld (100 ft)	18.605
Pipe, line (100 ft)	146.804
Casing, oil well, carbon (100 ft)	154.216
Casing, oil well, alloy (100 ft)	227.075
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin plate, hot-dipped, 1.25 lb	6.533
Tin plate, electrolytic, 0.25 lb	7.233
Black plate, can making quality	6.333
Wire, drawn, carbon	7.938
Wire, drawn, stainless, 430 (lb)	0.545
Bale ties (bundle)	5.860
Nails, wire, 8d common	7.815
Wire, barbed (80-rod spool)	7.097
Woven wire fence (20-rod roll)	16.815

‡ Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Feb. 9 1965	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av.=100)	194.53	194.53	194.53	189.74	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.82	$117.82	$117.82	$113.91	$93.00
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.37	57.37	57.37	57.27	47.27
Steelmaking Scrap, GT	36.33	35.25	36.00	27.50	27.42

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 84; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Feb. 9 1965	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	5.302	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.45-6.05	4.35-.40
Wire, Basic, Pitts.	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	4.675	4.675	4.675	4.525	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt, Pitts.	$38.00	$35.75	$36.50	$29.50	$31.25
No. 1 Heavy Melt, E. Pa.	37.00	36.00	33.50	26.00	23.50
No. 1 Heavy Melt, Chicago	34.00	34.00	35.00	27.00	27.50
No. 1 Heavy Melt, Valley	36.50	36.50	36.50	27.50	31.25
No. 1 Heavy Melt, Cleve.	34.00	33.50	33.50	25.50	28.25
No. 1 Heavy Melt, Buffalo	32.50	30.50	30.50	25.00	27.75
Rails, Rerolling, Chicago	49.50	49.50	53.00	36.50	39.50
No. 1 Cast, Chicago	40.00	40.00	40.00	29.50	40.50
COKE, Net Ton					
Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$13.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.50
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price Feb. 9	Last Change	Previous Price	Jan. Avg.	Dec. Avg.	Feb. 1954 Avg.
Copper	33.00	Jan. 28, 1955	30.00	30.180	30.000	29.750
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	12.610
Zinc	11.50	Sept. 3, 1954	11.00	11.500	11.500	9.360
Tin	92.00	Feb. 9, 1955	91.125	87.280	88.640	85.181
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 13, 1955	22.20	22.900	22.200	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, deld.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

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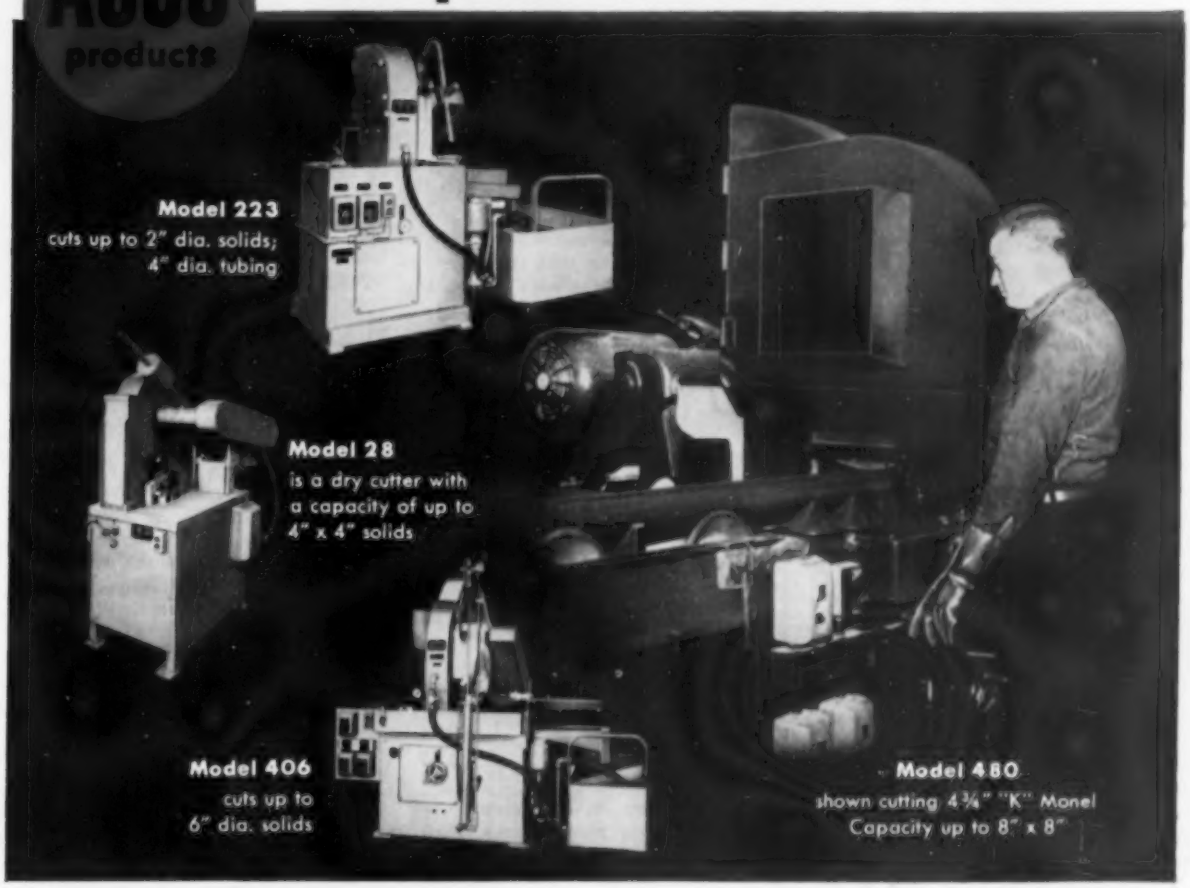

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Nonferrous Metals

Tug of war over copper price: American producers continue to feel pressure from London bull market. Rhodesian production begins recovery, but situation is still complex

Nonferrous Metal Prices, Pages 128 & 129

COPPER remains in the nonferrous spotlight. Unless a miracle intervenes, it will continue to be the most talked about metal.

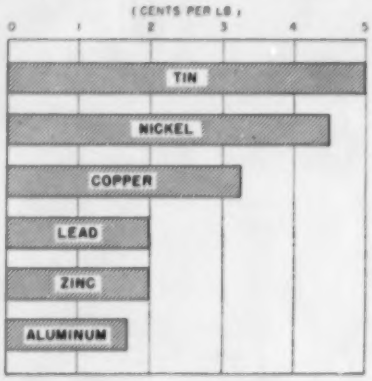
After taking the reluctant step of hiking the metal's price two weeks ago, producers and fabricators hoped that the whole situation would simmer down. Just the opposite has happened; it has boiled over. London continues to exert pressure on the price, and it's a question of what will happen first: Either London's bubble is going to burst or the domestic price will have to take another advance to attract foreign metal and protect secondary refineries who can't pay the going price for scrap and make a profit on the domestic market.

What a Difference!—When Anaconda made the initial move on Jan. 28, the difference between domestic and London prices was only 9 cents. By press time, the difference had widened to over 11 cents. How much higher London can push the price without having disastrous results is anybody's guess, but the American market can't stand too much more. Thirty-three cents right now is an unrealistic level, report American producers. It must be remembered that they considered 30 cents a good price. But even 33 cents isn't a good price when you can get one-third more on the world market.

This situation is still a temporary one, however. It could subside a bit in the next month or two. As pointed out in this column last week, the crux of the matter is Rhodesian production, or lack of it. Basically, it is responsible for the Commerce department's action in restricting exports of refined copper and scrap for February and March. But as of last week, Rhodesian production had come up to 40 per cent of capacity, with indications that it would reach about two-thirds of normal in another week or two. That may be wishful thinking, but it is bound to have its effect on the market. Much of the London pressure has been in *anticipation* of a shortage rather than an *actual* shortage. It takes about three months for Rhodesian metal to get from the mine to European markets, which means that production from that factor during the last quarter of 1954 is still in circulation. Not until late March or early April will the pinch in supply be fully felt. If the mines are back in full production by that time, buyers may have a tendency to hold the price down in anticipation of the better supply situation. Then perhaps the market can return to normal, and the U. S. price can seek its former 30-cent level.

Measuring the Rise in Prices

Between Feb. 4, 1954, and Feb. 2, 1955



Some Help — In the meantime American producers are doing everything possible to increase the domestic supply to relieve the temporary shortage. In addition to new mines coming in, existing mines are stepping up operations. Kennecott Copper Corp. announced that it will increase copper output at its two mines in Utah and Nevada by about 4,750,000 lb per month. It will do this by going to a seven-day week in Nevada and adding more equipment in Utah.

But that doesn't solve the dilemma of the secondary producers who were paying 30.5 cents a pound for scrap and then finding they couldn't export the refined copper to get the extra price and make a profit. The government's action of restricting exports is expected to have a dampening effect on scrap price, but it doesn't solve the problem; it just complicates it. The immediate effect was to aggravate the scare buying in England and to force the price still higher.

The long-term outlook for 1955 is good, says R. L. Prain, chairman of Roan Antelope Copper Mines Ltd. and Rhodesian Selection Trust Ltd. He thinks the balance between supply and demand in 1955 will be about even, and that 30 cents a pound would support the mines. While he did not say so specifically, this outlook must have been predicated on normal mine operations, not conditions as they are now.

TVA Water Shortage Threatens

Water shortage in the TVA area threatens to aggravate the shortage of aluminum. Lakes in the TVA system have shrunk to the smallest proportions in its history and have forced Aluminum Co. of America and Reynolds Metals Co. to shut down some potlines due to the resulting power shortage. More potlines were scheduled to go down last week unless an appreciable amount of rain had fallen. Meantime, Alcoa is going ahead with its plans to build a new dam and hydroelectric power generating facilities on Little Tennessee river at the Chilhowee site in Blount and Monroe counties, Tennessee. Application has been made to Federal Power Commission for a license to build and operate the project.

Market Memos

• An excise tax restricting excessive imports of lead and zinc is recommended by Otto Herres, chairman of National Lead & Zinc Committee, to achieve the vigorous and strong domestic mining industry wanted by President Eisenhower. During the first ten months of 1954, the U. S. imported over 45,000 tons of zinc a month from foreign ores and about 13,000 tons of slab zinc. Domestic mine output dropped to about 39,000 tons a month in that same period.

• Shipments of magnesium products in 1954 fell off the 1953 pace by about one-fifth. Ingot output was 69,723 tons compared with 93,075 in 1953, and wrought product shipments were 6946 tons, compared with 8443 tons the year before.

• Proponents of duty-free importation of certain forms of aluminum are trying to get their bills through Congress again. Three bills, which would lift tariffs on these products, have been introduced in the House.

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Aluminum Alloy: No. 13, 12% Si, 23.00; No. 43, 5% Si, 24.8; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 28.2; No. 195, 4.5% Cu, 0.6%, Si, 25.5; No. 214, 3.8% Mg, 26.2; No. 356, 7% Si, 0.3% Mg, 24.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $118.30 per lb, nom.

Copper: Electrolytic 33.00 deld, Conn. Valley, 33.00 deld. Midwest; Lake 33.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $130-$135 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $525-$527, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $120-$140 nom. per troy oz.

Palladium: $17-$21 per troy oz.

Platinum: $77-$80 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $120-$125 per troy oz.

Ruthenium: $60-$65 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 85.25 per oz.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $40.20 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 92.00, prompt 91.75.

Titanium: Sponge, 99.3 + %, grade A-1 ductile (0.3% Fe max) $4.50, grade A-2 (0.5% Fe max) $4 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.00 per lb nom., f.o.b. shipping point; less than 1000 lb $5.10 nom.; 99 + % hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.95, special high grade 13.00, die casting alloy ingot 15.50, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 26.50-27.25; No. 12 foundry alloy (No. 2 grade) 25.75-26.25; 5% silicon alloy, 0.60 Cu max., 27.25-27.75; 13 alloy 0.60 Cu max., 27.25-27.75; 195 alloy 26.50-27.50; 108 alloy 26.50-27.00; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 27.25-28.25; grade 2, 26.25-27.25; grade 3, 25.50-26.50; grade 4, 24.75-25.50.

Brass Ingot: Red brass No. 115, 33.00; tin bronze No. 225, 43.50; No. 245, 37.75; high-leaded tin bronze, No. 305, 37.00; No. 1 yellow, No. 405, 28.75; manganese bronze No. 421, 30.75.

Magnesium Alloy Ingot: AZ63A, 31.00; AZ91B, 26.00; AZ91C, 31.00; AZ92A, 31.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.71; rod, bar, wire, $1.68.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 38.33; 30,000 lb lots, 38.48; l.c.l. 38.98. Weatherproof, 100,000 lb, 38.53; 30,000 lb, 38.78; l.c.l. 39.28. Magnet wire deld., 15,000 lb or more 44.99; l.c.l. 45.74.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20.00 per cwt; pipe, full coils $20.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 19.00-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish c.l. (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.038	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.4
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max. dia. †26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in. 24-56 in. width or dia, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or dia., 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.8-37.3, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.6-41 in random lengths 0.375-4.0 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe Size, in.		Nom. pipe Size, in.	
⅜	$16.10	2	$ 49.55
1	25.35	4	136.60
1¼	34.30	6	244.90
1½	41.00	8	365.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 83.00, 20,000 lb or more 0.250-in. and over widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 65.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in lots)

Aluminum: 1100 clippings 16.00; old sheet 13.00-13.50; borings and turnings 8.00-9.00; crankcases 13.00-13.50; industrial castings 13.00-13.50.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.76-51.76b	46.36-49.36	.....	48.82-51.82	29.000	29.000	28.250
Yellow Brass	42.27-44.27	42.21-44.21	42.81-44.81	45.18-47.18	21.875	21.625	20.125
Red Brass, 85%	45.89-48.44	45.83-48.38	46.43-48.98	48.70-51.25	26.500	26.250	24.750
Low Brass, 80%	44.95-47.35	44.89-47.29	45.49-47.89	47.76-50.16	24.625	24.375	23.875
Naval Brass	46.38-46.39	46.69-46.70	53.43-53.44	49.54-49.55	20.250	20.000	19.500
Com. Bronze, 90%	47.38-50.06	47.32-50.02	47.92-50.62	49.94-52.64	26.625	26.375	25.875
Nickel Silver, 10%	56.30	60.40g	58.63	....	26.000	25.750	13.000
Phos. Bronze, A, 5%	67.28-70.12	67.78-67.81	67.78-67.81	68.96	29.375	29.125	28.125
Silicon Bronze	53.07	52.26	53.11	54.92e	28.000	27.750	27.000
Manganese Bronze	50.09-50.11	44.35-44.36	54.74	....	20.375	20.125	19.500
Muntz Metal	44.54	40.35	....	....	20.625	20.375	19.875

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire No. 1 28.50-29.00; No. 2 copper 27.50-28.00; light copper 26.00-26.50; No. 1 composition red brass 23.00-23.50; No. 1 composition turnings 22.50-23.00; yellow brass turnings 15.50; new brass clippings 21.00; No. 1 brass rod turnings 18.00; light brass 15.00; heavy yellow brass 18.00-18.50; new brass rod ends 19.00; auto radiators, unsweated 18.50-19.00; cocks and faucets 19.50-20.00; brass pipe 19.50-20.00.

Lead: Heavy 11.50; battery plate 6.25-6.50; linotype and stereotype 13.50-14.00; electrotype 12.00-12.50; mixed babbitt 12.00-12.50

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 15.50-16.50.

Monel: Clippings 28.00; old sheet 26.00; turnings 21.00; rods 28.00.

Nickel: Sheets and clips 57.00; rolled anodes 57.00; turnings 40.00; rod ends 57.00.

Tin: No. 1 pewter 50.00-55.00; block tin pipe 70.00-75.00; No. 1 babbitt 45.00.

Zinc: Old zinc, 5.50; new die cast scrap, 4.75-5.00; old die cast scrap, 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings 18.00-19.50; 3003 clippings 18.00-19.00; 6151 clippings 18.00-19.00; 5052 clippings 18.00-19.50; 2014 clippings 17.50-18.50; 2017 clippings 17.50-18.50; 2024 clippings 17.50-18.50; mixed clippings 16.50-17.50; old sheet 16.00-17.50; old cast 16.50-17.50; clean old cable (free of steel) 18.50-19.50; borings and turnings 16.50-18.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 31.50; No. 2 copper 30.00; light copper 28.50; refinery brass (60% copper) per dry copper content 27.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 30.50-31.00; No. 2 copper 29.00-29.50; light copper 27.50-28.00; No. 1 composition borings 25.75; No. 1 composition solids 26.00; heavy yellow brass solids 20.50-21.00; yellow brass turnings 19.50; radiators 20.50-21.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 48.42, oval 47.92, 5000-10,000 lb; electrodeposited 42.78, cast 45.04, 2000-5000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.095; 200-499 lb $1.08; 500-999 lb $1.075; 1000 lb or more $1.07.

Zinc: Bar 20.00, bar or flat top 19.00 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90; 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 350 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 79.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 70.1; 100-600 lb 55.9; 700-1900 lb 53.4, 2000-9900 lb 51.7; 10,000 lb or more 50.6.

Stannous Chloride (Anhydrous): Less than 50 lb $1.558; 50 lb $1.218; 100-300 lb $1.068, 400-900 lb $1.043; 1000-1900 lb $1.019; 2000-4900 lb 98.2; 5000-19,900 lb 92.1, 20,000 lb and over 86.

Stannous Sulphate: Less than 5 lb $1.258; 50 lb 95.8; 100-1900 lb 93.8; 2000 lb and over 91.8.

Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

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look good from any angle
Whether you're angling for a new product design, re-designing an established product, or casting for fresh design ideas for a functional part or decorative trim . . . take a good look at Nickeloid pre-plated Metals. Reflected in their gleaming, durable finishes of chrome, nickel, copper and brass you will find a whole new realm of exciting design possibilities. You will find, too, many design success stories which resulted when Nickeloid Metals were considered in the pre-design stage, to take full advantage of their versatility and their lower production cost.
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Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; Key on page 131. Key to footnotes, page 133.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5	$61.50

INGOTS, Alloy (NT)

Detroit R7	$65.00
Houston S5	70.00
Midland,Pa. C16	65.00
Munhall,Pa. U5	65.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5	$64.00
Bessemer,Pa. U5	64.00
Bridgeport,Conn. N19	*69.00*
Buffalo R2	64.00
Clairton,Pa. U5	64.00
Ensley,Ala. T2	64.00
Fairfield,Ala. T2	64.00
Fontana,Calif. K1	72.00
Gary,Ind. U5	64.00
Johnstown,Pa. B2	64.00
Lackawanna,N.Y. B2	64.00
Munhall,Pa. U5	64.00
Pittsburgh J5	64.00
So.Chicago,Ill. R2, U5	64.00
So.Duquesne,Pa. U5	64.00
Youngstown R2	64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5	$78.00
Bessemer,Pa. U5	78.00
Bridgeport,Conn. N19	*83.00*
Buffalo R2	78.00
Canton,O. R2	80.00
Clairton,Pa. U5	78.00
Conshohocken,Pa. A3	83.00
Ensley,Ala. T2	78.00
Fairfield,Ala. T2	78.00
Fontana,Calif. K1	86.00
Gary,Ind. U5	78.00
Geneva,Utah C11	78.00
Houston S5	83.00
Johnstown,Pa. B2	78.00
Lackawanna,N.Y. B2	78.00
LosAngeles B3	87.50
Midland,Pa. C18	78.00
Munhall,Pa. U5	78.00
Pittsburgh J5	78.00
Seattle B3	91.50
So.Chicago R2,U5,W14	78.00
So.Duquesne,Pa. U5	78.00
So.SanFrancisco B3	87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2	$86.00
Buffalo R2	86.00
Canton,O. R2, T7	86.00
Conshohocken,Pa. A3	93.00
Detroit R7	86.00
Fontana,Calif. K1	105.00
Gary,Ind. U5	86.00
Houston S5	91.00
Ind.Harbor,Ind. Y1	86.00
Johnstown,Pa. B2	86.00
Lackawanna,N.Y. B2	86.00
LosAngeles B3	106.00
Massillon,O. R2	86.00
Midland,Pa. C18	86.00
Munhall,Pa. U5	86.00
So.Chicago, R2,U5,W14	86.00
So.Duquesne,Pa. U5	86.00
Struthers,O. Y1	86.00
Warren,O. C17	86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$96.50
Canton,O. R2	96.50
Cleveland R2	96.50
Gary,Ind. U5	96.50
So.Chicago R2, W14	96.50
So.Duquesne,Pa. U5	96.50

SKELP

Aliquippa,Pa. J5	4.00
Fontana,Calif. K1	4.775
Munhall,Pa. U5	3.90
SparrowsPoint,Md. B2	3.90
Warren,O. R2	3.90
Youngstown R2, U5	3.90

WIRE RODS

AlabamaCity,Ala. R2	4.675
Aliquippa,Pa. J5	4.675
Alton,Ill. L1	4.85
Buffalo W11, W12	4.675
Cleveland A7	4.675
Donora,Pa. A7	4.675
Fairfield,Ala. T2	4.675
Fontana,Calif. K1	5.475
Houston S5	4.925
IndianaHarbor,Ind. Y1	4.675
Johnstown,Pa. B2	4.675
Joliet,Ill. A7	4.675
KansasCity,Mo. S5	4.925
Kokomo,Ind. C16	4.775
LosAngeles B3	5.476
Minnequa,Colo. C10	4.925
Monessen,Pa. P7	4.675
No.Tonawanda,N.Y.B11	4.675
Pittsburg,Calif. C11	5.325
Portsmouth P12	4.675
Roebling,N.J. R5	4.775
So.Chicago,Ill. R2	4.675
SparrowsPoint,Md. B2	4.775
Sterling,Ill.(1) N15	4.675
Sterling,Ill. N15	4.775
Struthers,O. Y1	4.675
Torrance,Calif. C11	5.475
Worcester,Mass. A7	4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2	4.25
Aliquippa,Pa. J5	4.25
Bessemer,Ala. T2	4.25
Bethlehem,Pa. B2	4.30
Birmingham C15	4.25
Clairton,Pa. U5	4.25
Fairfield,Ala. T2	4.25
Fontana,Calif. K1	4.90
Gary,Ind. U5	4.25
Geneva,Utah C11	4.25
Houston S5	4.30
Ind.Harbor,Ind. I-2	4.25
Johnstown,Pa. B2	4.30
KansasCity,Mo. S5	4.30
Lackawanna,N.Y. B2	4.30
LosAngeles B3	4.95
Minnequa,Colo. C10	4.70
Munhall,Pa. U5	4.25
Niles,Calif. P1	4.90
Phoenixville,Pa. P4	3.95
Portland,Oreg. O4	5.00
Seattle B3	5.00
So.Chicago U5, W14	4.25
So.SanFrancisco B3	4.90
Torrance,Calif. C11	4.95
Weirton,W.Va. W6	4.25

Wide Flange

Bethlehem,Pa. B2	4.30
Clairton,Pa. U5	4.25
Fontana,Calif. K1	5.25
Lackawanna,N.Y. B2	4.30
Munhall,Pa. U5	4.25
Phoenixville,Pa. P4	3.95
So.Chicago,Ill. U5	4.25

Alloy Stand. Shapes

Clairton,Pa. U5	5.20
Fontana,Calif. K1	6.60
Gary,Ind. U5	5.20
Houston S5	5.45
Munhall,Pa. U5	5.20
So.Chicago,Ill. U5	5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	6.40
Bessemer,Ala. T2	6.40
Bethlehem,Pa. B2	6.45
Clairton,Pa. U5	6.40
Fairfield,Ala. T2	6.40
Fontana,Calif. K1	7.05
Gary,Ind. U5	6.40
Geneva,Utah C11	6.40
Houston S5	6.45
Ind.Harbor,Ind. I-2, Y1	6.40
Johnstown,Pa. B2	6.45
KansasCity,Mo. S5	6.45
Lackawanna,N.Y. B2	6.40
LosAngeles B3	7.10
Munhall,Pa. U5	6.40
Seattle B3	7.15
So.Chicago,Ill. U5, W14	6.40
So.SanFrancisco B3	7.05
Struthers,O. Y1	6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	6.45
Lackawanna,N.Y. B2	6.45
Munhall,Pa. U5	6.40
So.Chicago,Ill. U5	6.40

PILING

BEARING PILES

Munhall,Pa. U5	4.25
So.Chicago,Ill. U5	4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	5.075
Lackawanna,N.Y. B2	5.075
Munhall,Pa. U5	5.075
So.Chicago,Ill. U5	5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2	4.225
Aliquippa,Pa. J5	4.225
Ashland,Ky.(15) A10	4.225
Bessemer,Ala. T2	4.225
Bridgeport,Conn. N19	*4.475*
Buffalo R2	4.225
Clairton,Pa. U5	4.225
Claymont,Del. C22	4.225
Cleveland J5, R2	4.225
Coatesville,Pa. L7	4.225
Conshohocken,Pa. A3	4.225
Ecorse,Mich. G5	4.325
Fairfield,Ala. T2	4.225
Fontana,Calif.(30) K1	4.875
Gary,Ind. U5	4.225
Geneva,Utah C11	4.225
GraniteCity,Ill. G4	4.425
Harrisburg,Pa. C5	3.975
Houston S5	4.275
Ind.Harbor,Ind. I-2, Y1	4.225
Johnstown,Pa. B2	4.225
Lackawanna,N.Y. B2	4.225
LoneStar,Tex. L4	4.55
Mansfield,O. E8	4.225
Minnequa,Colo. C10	5.075
Munhall,Pa. U5	4.225
Newport,Ky. N9	4.225
Pittsburgh J5	4.225
Riverdale,Ill. A1	4.225
Seattle B3	5.125
Sharon,Pa. S3	4.225
So.Chicago,Ill. R2	4.225
So.Chicago,Ill. U5,W14	4.225
SparrowsPoint,Md. B2	4.225
Steubenville,O. W10	4.225
Warren,O. R2	4.225
Weirton,W.Va. W6	4.225
Youngstown R2,U5,Y1	4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1	6.025
Geneva,Utah C11	5.375

PLATES, Wrought Iron

Economy,Pa. B14	9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5	5.45
Bessemer,Ala. T2	6.45
Clairton,Pa. U5	5.45
Cleveland J5, R2	6.45
Coatesville,Pa. L7	*6.45*
Conshohocken,Pa. A3	6.45
Ecorse,Mich. G5	6.55
Fairfield,Ala. T2	6.45
Fontana,Calif.(30) K1	7.15
Gary,Ind. U5	6.45
Geneva,Utah C11	6.45
Houston S5	6.50
Ind.Harbor,Ind. I-2, Y1	6.45
Johnstown,Pa. B2	6.45
Lackawanna,N.Y. B2	6.45
LosAngeles B3	7.35
Munhall,Pa. U5	6.45
Pittsburgh J5	6.45
Seattle B3	7.35
Sharon,Pa. S3	6.45
So.Chicago,Ill. U5, W14	6.45
SparrowsPoint,Md. B2	6.45
Youngstown U5, Y1	6.45

PLATES, Alloy

Claymont,Del. C22	5.80
Coatesville,Pa. L7	5.80
Fontana,Calif. K1	6.45
Gary,Ind. U5	5.80
Houston S5	5.85
Ind.Harbor,Ind. Y1	5.80
Johnstown,Pa. B2	5.80
Munhall,Pa. U5	5.80
Newport,Ky. N9	5.80
Seattle B3	6.70
Sharon,Pa. S3	5.80
So.Chicago,Ill. U5, W14	5.80
SparrowsPoint,Md. B2	5.80
Youngstown Y1	5.80

FLOOR PLATES

Cleveland J5	5.275
Conshohocken,Pa. A3	5.275
Harrisburg,Pa. C9	5.15
Ind.Harbor,Ind. I-2	5.275
Munhall,Pa. U5	5.275
So.Chicago,Ill. U5	5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10	4.475
Ashland l.c.l. (15) A10	4.975
Cleveland c.l. R2	4.825
Warren,O. c.l. R2	4.825

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala. R2	4.30
Aliquippa,Pa. J5	4.30
Alton,Ill. L1	4.50
Atlanta,Ga. A11	4.50
Bessemer,Ala. T2	4.30
Birmingham C15	4.30
Bridgeport,Conn. N19	*4.55*
Buffalo R2	4.30
Canton,O. R2	4.40
Clairton,Pa. U5	4.30
Cleveland R2	4.30
Ecorse,Mich. G5	4.40
Emeryville,Calif. J7	5.05
Fairfield,Ala. T2	4.30
FairlessHills,Pa. U5	4.45
Fontana,Calif. K1	5.00
Gary,Ind. U5	4.30
Houston S5	4.55
Ind.Harbor,Ind. I-2, Y1	4.30
Johnstown,Pa. B2	4.30
KansasCity,Mo. S5	4.55
Lackawanna,N.Y. B2	4.30
LosAngeles B3	5.00
Massillon,O. R2	4.40
Midland,Pa. C18	4.30
Milton,Pa. M18	4.30
Minnequa,Colo. C10	4.75
Niles,Calif. P1	5.00
N.Tonawanda,N.Y. B11	4.30
Pittsburg,Calif. C11	5.00
Pittsburgh J5	4.30
Portland,Oreg. O4	5.05
Seattle B3, N14, P23	5.05
So.Chicago, R2,U5,W14	4.30
So.Duquesne,Pa. U5	4.30
So.SanFran.,Calif. B3	5.05
Sterling,Ill.(1) N15	4.30
Sterling,Ill. N15	4.40
Struthers,O. Y1	4.30
Torrance,Calif. C11	5.00
Warren,O. R2	4.30
Weirton,W.Va. W6	4.30
Youngstown R2, U5	4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	5.075
Bridgeport,Conn. N19	*5.225*
Buffalo R2	5.075
Canton,O. R2, T7	5.075
Clairton,Pa. U5	5.075
Detroit R7	5.075
Ecorse,Mich. G5	5.175
Fontana,Calif. K1	6.125
FairlessHills,Pa. U5	5.225
Gary,Ind. U5	5.075
Houston S5	5.325
Johnstown,Pa. B2	5.075
KansasCity,Mo. S5	5.325
Lackawanna,N.Y. B2	5.075
LosAngeles B3	6.125
Massillon,O. R2	5.075
Midland,Pa. C18	5.075
So.Chicago R2, U5,W14	5.075
So.Duquesne,Pa. U5	5.075
Struthers,O. Y1	5.075
Warren,O. C17	5.075
Youngstown U5	5.075

BARS, H.R. Leaded Alloy

Warren,O. C17	5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5	6.45
Bessemer,Ala. T2	6.45
Bethlehem,Pa. B2	6.45
Clairton,Pa. U5	6.45
Cleveland R2	6.45
Ecorse,Mich. G5	6.55
Fairfield,Ala. T2	6.45
Fontana,Calif. K1	7.70
Gary,Ind. U5	6.45
Houston S5	6.70
Ind.Harb.,Ind. I-2, Y1	6.45
Johnstown,Pa. B2	6.45
KansasCity,Mo. S5	6.70
Lackawanna,N.Y. B2	6.45
LosAngeles B3	7.15
Pittsburgh J5	6.45
Seattle B3	7.20
So.Chicago W14	6.45
So.Duquesne,Pa. U5	6.45
So.SanFrancisco B3	7.20
Struthers,O. Y1	6.45
Warren,O. R2	6.45
Youngstown U5	6.40

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2	4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5	4.30
Atlanta A11	4.50
Fontana,Calif. K1	5.00
Niles,Calif. P1	5.00
Pittsburgh J5	4.30
Portland,Oreg. O4	5.05
SanFrancisco S7	4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	5.20
Gary,Ind. U5	5.20
Houston S5	5.45
KansasCity S5	5.45
Youngstown U5	5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	5.40
BeaverFalls,Pa. M12, R2	5.40
Buffalo B5	5.45
Camden,N.J. P13	5.85
Carnegie,Pa. C12	5.40
Chicago W18	5.40
Cleveland A7, C20	5.40
Detroit R7	5.40
Detroit B5, P17	5.90
Donora,Pa. A7	5.40
Elyria,O. W8	5.40
FranklinPark,Ill. N5	5.40
Gary,Ind. R2	5.40
GreenBay,Wis. F7	5.40
Hammond,Ind. L2, M13	5.40
Hartford,Conn. R2	5.90
Harvey,Ill. B5	5.40
LosAngeles R2, S30	6.85
Mansfield,Mass. B5	5.95
Massillon,O. R2, R8	5.40
Midland,Pa. C18	5.40
Monaca,Pa. S17	5.40
Newark,N.J. W18	5.85
NewCastle,Pa.(17) B4	5.40
Pittsburgh J5	5.40
Plymouth,Mich. P5	5.65
Putnam,Conn. W18	5.95
Readville,Mass. C14	5.95
So.Chicago,Ill. W14	5.40
SpringCity,Pa. K3	5.85
Struthers,O. Y1	5.40
Waukegan,Ill. A7	5.40
Worcester,Mass. W19	5.85
Youngstown F3, Y1	5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19	4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	6.625
BeaverFalls,Pa. M12,R2	6.625
Bethlehem,Pa. B2	6.625
Buffalo B5	6.625
Camden,N.J. P13	6.80
Canton,O. T7	6.625
Carnegie,Pa. C12	6.625
Chicago W18	6.625
Cleveland A7, C20	6.625
Detroit R7	6.625
Detroit B5, P17	6.825
Donora,Pa. A7	6.625
Elyria,O. W8	6.625
Gary,Ind. R2	6.625
GreenBay,Wis. F7	6.625
Hammond,Ind. L2, M13	6.625
Hartford,Conn. R2	6.925
Harvey,Ill. B5	6.625
Lackawanna,N.Y. B2	6.625
LosAngeles S30	8.30
Mansfield,Mass. B5	6.925
Massillon,O. R2, R8	6.625
Midland,Pa. C18	6.625
Monaca,Pa. S17	6.625
Newark,N.J. W18	6.80
Plymouth,Mich. P5	6.825
So.Chicago W14	6.625
SpringCity,Pa. K3	6.80
Struthers,O. Y1	6.625
Warren,O. C17	6.625
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925
Youngstown F3, Y1	6.625

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18	7.525
Camden,N.J. P13	7.70
Carnegie,Pa. C12	7.525
Chicago W18	7.525
Cleveland C20	7.525
Monaca,Pa. S17	7.525
Newark,N.J. W18	7.70
SpringCity,Pa. K3	7.70
Warren,O. C17	7.525

BARS, Reinforcing (To fabricators)

Ala.City,Ala. R2	4.30
Atlanta A11	4.50
Birmingham C15	4.30
Buffalo R2	4.30
Cleveland R2	4.30
Emeryville,Calif. J7	5.05
Fairfield,Ala. T2	4.30
FairlessHills,Pa. U5	4.45
Fontana,Calif. K1	5.00
Ft.Worth,Tex.(42) T4	4.90
Gary,Ind. U5	4.30
Houston S5	4.55

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2	4.05
Allenport,Pa. P7	4.05
Ashland,Ky.(8) A10	4.05
Cleveland J5, R2	4.05
Conshohocken,Pa. A3	4.10
Detroit(8) M1	4.15
Ecorse,Mich. G5	4.15
Fairfield,Ala. T2	4.05
FairlessHills,Pa. U5	4.10
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Geneva,Utah C11	4.15
GraniteCity,Ill. G4	4.25
Houston S5	4.30
Ind.Harbor,Ind. I-2, Y1	4.05
Irvin,Pa. U5	4.05
Kokomo,Ind. C16	4.15
Lackawanna,N.Y. B2	4.05
Mansfield,O. E6 (37)	4.05
Mansfield,O. E6(38)	4.80
Munhall,Pa. U5	4.05
Newport,Ky. N9	4.05
Niles,O. N12	4.05
Pittsburg,Calif. C11	4.75
Pittsburgh J5	4.05
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
SparrowsPoint,Md. B2	4.05
Steubenville,O. W10	4.05
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5, Y1	4.05

SHEETS, H.R. (19 ga. lighter)

Ala.City,Ala. R2	5.35
Kokomo,Ind. C16	5.20
Niles,O. N12	4.85

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1	5.80
Youngstown Y1	5.80

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2	6.10
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.20
Fairfield,Ala. T2	6.10
FairlessHills,Pa. U5	6.15
Fontana,Calif. K1	6.875
Gary,Ind. U5	6.10
Ind.Harbor,Ind. I-2, Y1	6.10
Irvin,Pa. U5	6.10
Lackawanna(35) B2	6.10
Munhall,Pa. U5	6.10
Pittsburgh J5	6.10
Sharon,Pa. S3	6.10
So.Chicago,Ill. U5	6.10
SparrowsPoint(36) B2	6.10
Warren,O. R2	6.10
Weirton,W.Va. W6	6.10
Youngstown U5, Y1	6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10	4.30
Cleveland R2	4.65
Ind.Harbor,Ind. I-2	4.30
Warren,O. R2	4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7	4.95
Cleveland J5, R2	4.95
Conshohocken,Pa. A3	5.00
Ecorse,Mich. G5	5.05
Fairfield,Ala. T2	4.95
FairlessHills,Pa. U5	5.00
Follansbee,W.Va. F4	4.95
Fontana,Calif. K1	6.05
Gary,Ind. U5	4.95
GraniteCity,Ill. G4	5.15
Ind.Harbor,Ind. I-2, Y1	4.95
Irvin,Pa. U5	4.95
Lackawanna,N.Y. B2	4.95
Middletown,O. A10	4.95
Newport,Ky. N9	4.95
Pittsburg,Calif. C11	5.90
Pittsburgh J5	4.95
Portsmouth,O. P12	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown Y1	4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2	7.55
Ecorse,Mich. G5	7.60
FairlessHills,Pa. U5	7.55
Fontana,Calif. K1	8.55
Gary,Ind. U5	7.50
IndianaHarbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Lackawanna(37) B2	7.50
Pittsburgh J5	7.50
SparrowsPoint(38) B2	7.50
Warren,O. R2	7.50
Weirton,W.Va. W6	7.50
Youngstown Y1	7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	5.55
Middletown,O. A10	5.45
Warren,O. R2	5.55

SHEETS, Culvert (16 Ga.)

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind.Harbor I-2	5.70	5.95
Irvin,Pa. U5	5.70	....
Kokomo,Ind. C16	5.80	....
MartinsFry.,O. W10	5.70	....
Newport,Ky. N9	5.70	5.95
Pitts.,Calif. C11	6.45	....
SparrowsPt. B2	5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10	6.75
Gary,Ind. U5	5.95
MartinsFerry,O. W10	5.95

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2	5.45‡
Ashland,Ky. A10	5.45*
Butler,Pa. A10	5.45†
Canton,O. R2	5.45‡
Delphos,O. N16	6.10‡
Dover,O. R1	5.65‡
Fairfield,Ala. T2	5.45†
Gary,Ind. U5	5.45*
GraniteCity,Ill. G4	5.65‡
Ind.Harbor,Ind. I-2	5.45†
Irvin,Pa. U5	5.45†
Kokomo,Ind. C16	5.55‡
MartinsFerry,O. W10	5.45*
Middletown,O. A10	5.45†
Newport,Ky. N9	5.45†
Niles,O. N12	5.65‡
Pittsburg,Calif. C11	6.20*
SparrowsPt.,Md. B2	5.45‡
Weirton,W.Va. W6	5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1	6.325

SHEETS, Galvanized High-Strength Low-Alloy

Irvin,Pa. U5	8.20
SparrowsPoint(39) B2	8.20

SHEETS, Galvannealed Steel

Canton,O. R2	5.95
Irvin,Pa. U5	5.85
Kokomo,Ind. C16	5.95
Newport,Ky. N9	5.85
Niles,O. N12	5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10	5.70
Canton,O. R2	6.20

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10	5.70
Butler,Pa. A10	5.70
Middletown,O. A10	5.70

SHEETS, Electrogalvanized

Cleveland(28) R2	6.30
Niles,O.(28) R2	6.30
Weirton,W.Va. W6	6.15

SHEETS, Aluminum Coated

Butler,Pa. A10	8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	5.375
Cleveland R2	5.375
Gary,Ind. U5	5.375
GraniteCity,Ill. G4	5.575
Ind.Harbor,Ind. I-2	5.375
Irvin,Pa. U5	5.375
Middletown,O. A10	5.375
Niles,O. N12	5.375
Youngstown Y1	5.375

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4	7.375
Follansbee(23) F4	6.60
Yorkville,O. W10	7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.85
Gary,Ind. U5	5.85
Mansfield,O. E6	5.85
Middletown,O. A10	5.85
Niles,O. N12	5.85
Weirton,W.Va. W6	5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	6.25

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2	5.70
KansasCity S5	6.50
LosAngeles B3	5.95
Marion,O. P11	5.55
Pittsburgh J5, U8	5.72
Seattle B3, N14, P23	6.15
So.SanFrancisco B3	6.00
SparrowsPt. ¼-1" B2	5.70
Williamsport,Pa. S19	5.60

RAIL STEEL BARS

Avis,Pa.(3) J8	4.25
ChicagoHts.(3) C2, I-2	4.20
ChicagoHts.(4) C2, I-2	4.30
Ft.Worth,Tex.(26) T4	4.75
Franklin,Pa.(3) F5	4.20
Franklin,Pa.(4) F5	4.30
Marion,O.(3) P11	4.15
Moline,Ill.(3) R2	4.30
Tonawanda(3) B12	4.15
Tonawanda(4) B12	4.30
Williamsport,Pa.(3) S19	4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14	10.85
Economy,Pa.(D.R.) B14	13.50
Economy(Staybolt) B14	13.50
McK.Rks.(S.R.) L5	10.85
McK.Rks.(D.R.) L5	14.75
McK.Rks.(Staybolt) L5	16.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro MetaNurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 Melmore Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh MetaNurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S8 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn. N19	*4.15*
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.15
Ecorse,Mich. G5	4.15
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Houston,Tex.(9) S5	4.30
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
KansasCity,Mo.(9) S6	4.30
Lackaw'na,N.Y.(25) B2	4.05
LosAngeles(23) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	*7.00*
Carnegie,Pa. S15	6.70
Fontana,Calif. K1	5.10
Gary,Ind. U5	6.70
Houston,Tex. S5	6.95
Ind.Harbor,Ind. Y1	6.70
KansasCity,Mo. S6	6.95
LosAngeles B3	7.90
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.25
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.35
Gary,Ind. U5	6.15
Houston S5	6.55
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S6	6.75
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R3	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Boston T6	6.30
Cleveland A7, J5	5.75
Conshohocken,Pa. A3	5.85
Dearborn,Mich. D3	5.85
Detroit P20	5.90
Detroit D2, M1	5.85
Dover,O. G6	5.75
Ecorse,Mich. G5	5.85
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.65
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	5.85
Ind.Harbor,Ind. Y1	5.75
Indianapolis C8	5.90
Lackawanna,N.Y. B2	5.75
LosAngeles C1	7.80
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
NewKensington,Pa. A6	*5.75*
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.20
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Boston T6	12.80
Carnegie,Pa. S15	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	12.45
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	13.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.70
Dover,O. G6	8.60
Ecorse,Mich. G5	8.70
Ind.Harbor,Ind. Y1	8.60
Lackawanna,N.Y. B2	8.425

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S15	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
New Britain,Conn.(10) S15	*5.75*	*8.05*	*9.00*	*11.15*	*13.58*
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.26	....
NewKensington,Pa. A6	*5.75*	*8.05*	*9.00*	*11.15*	....
New York W8	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	6.35

STRIP, Electrogalvanized

Cleveland A7	5.75*
Dover,O. G6	5.75*
Riverdale,Ill. A1	5.85*
Youngstown C8	5.75*
Warren,O. B9, T5	5.75*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)

Sharon,Pa. S3	6.15
Warren,O. B9	6.15

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Irvin,Pa. U5	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60

TINPLATE,American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Irvin,Pa. U5	8.80	9.05
Pitts.,Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Irvin,Pa. U5	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Irvin,Pa. U5	6.20
Yorkville,O. W10	6.80

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5	$7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.00
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.00
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No.Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, MS Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Milbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Struthers,O. Y1	6.90
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7,T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric Motor		Dynamo
BeechBottom,W.Va. W10	....	....	9.10	10.10	11.00
Brackenridge,Pa. A4	....	....	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½¢ lower)	Field	Armature	Electric Motor		Dynamo
Brackenridge,Pa. A4	....	....	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*‡	8.95*	9.85*‡	10.85*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†‡	9.85†‡	10.85†‡	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225‡	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½¢ lower. ‖ Coils. ¾-cent higher.

WIRE

(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria, O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425‡
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.55
Buffalo W12	6.90 7.30†
Cleveland A7	6.90
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.15 7.55†
Jacks'ville,Fla. M8	7.425 7.95
JohnstownB2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.15 7.55†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90
Rankin A7	6.90 7.20†
So.Chicago R2	6.90 7.30**
S.S.Fran. C10	7.85 8.25**
SparrwsPt.B2(48)	7.00 7.55*
Sterling(1)(48)N15	6.90 7.45
Struthers,O.(48)Y1	6.90 7.40‡
Worcester A7	7.20

*Based on 11c zinc; †5c zinc; ‡ Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.

Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149‡
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	151†
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	151†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	*151***
Monessen,Pa. 9 ga. P17	149
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	149

†Based on 5c zinc; *11c zinc; ‡ 10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston S5	160
KansasCity,Mo. S5	160
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	159**
Aliquippa J5	156‡
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	164†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	164†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	*164***
Monessen,Pa. P7	162
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
S.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	162

†Based on 5c zinc; * 11c zinc; ‡10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)

	An'ld Galv. Stone Stans
Ala.City R2	13.15 14.70**
Bartonville K4	13.25 15.10
Buffalo W12	13.15
Cleveland A7	13.15
Crawfrdsville M8	13.25 15.10
Fostoria,O. S1	13.25 14.80†
Johnstown B2	13.15 15.00*
Kokomo C16	13.25 14.80†
Minnequa C10	13.40 15.10**
Palmer,Mas.W12	13.15 14.70†
Pitts.,Calif. C11	13.80 15.05†
So.Chicago R2	13.15 14.70
SparrowsPt. B2	13.25 15.10*
Sterling(1) N15	13.15 15.00
Waukegan A7	13.15 14.70†
Worcester A7	13.45

* Based on 11c zinc; † 5c zinc; ‡ 10c zinc; ** Subject to zinc equalization extras.

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	139
Houston,Tex. S5	142
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	142
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	139
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	139
Minnequa,Colo. C10	*142*
Monessen,Pa. P7	137
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill. (1) N15	137
Worcester,Mass. A7	144

TIE WIRES, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
Donora,Pa. A7	$8.77
Duluth,Minn. A7	8.77
Joliet,Ill. A7	8.77
Coil No. 6500 Stand.	
Donora,Pa. A7	$9.05
Duluth,Minn. A7	9.05
Joliet,Ill. A7	9.05
Coil No. 6500 Interim	
Donora,Pa. A7	$9.10
Duluth,Minn. A7	9.10
Joliet,Ill. A7	9.10

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
⅛-in. & smaller diam	2
Over 4 in. through 6 in.:	
⅛ in. & smaller diam	+2
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
⅞ in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams.:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoes	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅝" and smaller	55
⅞" to 1⅛", inclusive	58
1¼" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	38
⅞" to 1⅛", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
⅛ in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼ in. through ⅝-in.	38
⅝-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25

7/8-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.50	18.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1⅝	13	26.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2½	12	34.63	41.52	33.59
2⅝	12	36.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.83	42.72

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Toe Rolls All No. 2	Toe Rolls 60 lb Under
RAILS				
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...(16)	5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S19	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (30) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
99+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ¼ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns—83.00-148.00	
Aluminum:	
Atomized, 500 lb drums, frgt. allowed:	
Carlots	30.00
Ton lots	32.00
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	29.75-37.25†
Bronze, 5000-lb lots	48.75-52.00†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	98.00
Nickel-Silver, 5000-lb lots	45.50‡
Nickel-Silver, 5000-lb lots	49.00**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, 5000-lb lots	17.25-31.00‡
Tungsten	Dollars
Melting grade, 99% 60-to 200-mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.70c; 1 15/16" to 2 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cnts. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.142 to 0.340 in.; for gage 0.143 and lighter, 5.85c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill lengths.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.40c for carbon, add 0.40c for alloy and H.S.-L.A.
(31) Widths over ⅝-in.; 0.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 0.10c.
(43) 9-14½ gage.
(46) 6-7 gage.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Alabama City, Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden, Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda, N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda, N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester, N.Y., deld.	59.02	59.52	60.02	....
Syracuse, N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary, Ind. U5	56.00	....	56.50	....
Indiana Harbor, Ind. I-2	56.00	....	56.50	....
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago, Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	58.17
Muskegon, Mich., deld.	....	62.50	62.50	....
Cleveland District				
Cleveland A7, R3	56.00	56.50	56.50	57.00
Akron, O., deld.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem, Pa. B2	58.60	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	56.00	56.50	....	....
Chester, Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton, Pa. B2	56.00	56.50	59.00	59.50
Swedeland, Pa. A3	56.00	56.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy, N.Y. R2	56.00	56.50	59.00	59.50
Pittsburgh District				
Neville Island, Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKees Rocks, deld.	....	57.54	57.54	58.04
Lawrenceville, Homestead, Wilmerding, Monaca, deld.	....	58.16	58.16	58.66
Verona, Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	....	....	....
McKeesport, Pa. N3	56.00	....	....	57.00
Midland, Pa. C15	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard, O. Y1	....	....	56.50	....
Sharpeville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield, O. deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	60.50	61.00	61.50	....
Fontana, Calif. K1	62.00	62.50	....	....
Geneva, Utah C11	56.00	56.50	....	....
Granite City, Ill. G4	57.90	58.40	58.90	....
Ironton, Utah C11	56.00	56.50	....	....
Lone Star, Texas L6	52.00	52.50*	52.50	....
Minnequa, Colo. C10	56.00	59.00	59.00	....
Rockwood, Tenn. T2	....	52.50*	56.50	....
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 35 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	$65.00
Buffalo H1	64.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	$80.50
Keokuk, Iowa, Openhearth & Fdry, freight allowed K2	95.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Lyles, Tenn. T3	70.00
Rockwood, Tenn. T3	70.00
Steelton, Pa. B2	64.00
Philadelphia, deld.	67.55
Troy, N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Buffalo, 25 cents on C.R. and galvanized sheets, C.F. and alloy bars and 20 cents on other commodities; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302††	H.R.*	C.R.*	H.R. Bds.	C.F. Bds.§	H.R. Alloy 4140†‡		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.52[4]	12.54	6.72	6.37	7.76
Birmingham	6.25	7.35	8.25[3]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.53	45.38[5]	7.47	...	7.20	8.60	12.30	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.00	6.72	6.65	7.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	...	7.10	7.10	8.37
Chicago	6.26	7.26	8.20	46.05	6.62	...	6.51	7.50	11.75	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.80	12.00	6.86	6.81	7.89
Cleveland	6.26	7.26	8.25	46.14	6.72	...	6.57	7.60	11.81	7.02	6.69	7.81
Detroit	6.57	7.57	8.56	45.50	6.90	7.26	6.79	7.79	11.95	7.16	6.80	7.83
Erie, Pa.	6.35	7.35	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.50	....	7.80	7.35	8.75
Los Angeles	7.80	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.15	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.84	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	7.04	6.87	...
New York	6.07	7.91	8.79	44.95	7.86	...	7.37	8.73[4]	12.13	7.38	7.27	8.63
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.95[5]	6.96	8.80	6.74	8.36[4]	11.96	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.85	11.75	6.69	6.52	7.64
Portland, Oreg.	7.20	8.25	9.90	48.50	7.45	...	7.30	10.45	14.00	7.25	7.05	8.95
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.06	6.65	8.08
St. Louis	6.67	7.67	8.59	48.00	6.91	...	6.80	7.89	12.04	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.26	....	7.35	7.18	8.30
San Francisco	7.55	8.95	8.70	51.65	7.80	...	7.35	10.05	13.05	7.50	7.40	9.45
Seattle	8.10	9.60	10.15	51.00	8.20	...	7.80	10.95	13.50	7.75	7.80	9.60
Spokane	8.35	9.65[1]	10.05	....	7.90	...	7.80	10.85[4]	14.25	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.21	7.00	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati, Cleveland, Pittsburgh, San Francisco (11.50-cent zinc) and in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ¼-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle, 2000 to 9999 lb; stainless sheets, 1000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [1]—500 to 9999 lb; [2]—4000 lb and over; [3]—1000 to 1999 lb; [4]—1000 lb and over; [5]—1500 to 3999 lb; [6]—f.o.b. local delivery in lots of 10,000 lb and over.

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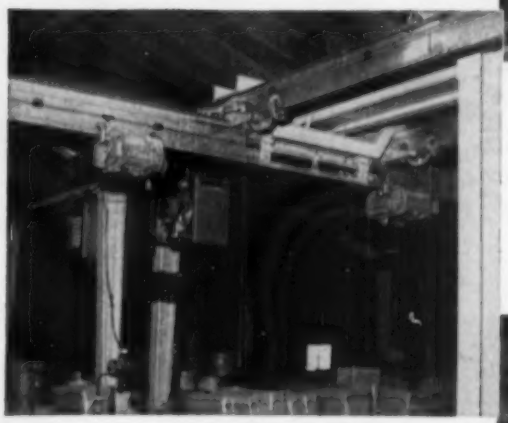
for smooth operation at low maintenance cost use...

Three-ton hoist hook service extends from craneway to craneway by finger-tip controlled passage of carrier across crossover with cranes interlocked at each end.



One-ton hoist operated from crane bridge to crane bridge interlocked at crossover between craneways.

Three MonoRail cranes are interlocked to form passageway for transfer from receiving dock to steel storage area. Crane in foreground interlocks with spur track to each shear.

To handle variable loads over maximum areas, MonoRail Cranes offer smooth travel, easy movement, interlocking service between and beyond craneways, low initial cost and most important low maintenance cost. American MonoRail engineers are experienced in all phases of "up and over" handling. They are available for free consultation at your convenience.

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- 1936 Two 12-ton Lectromelt Furnaces
- 1941 Two 50-ton Lectromelt Furnaces
- 1952 Two 150-ton Lectromelt Furnaces

CONFIDENCE in Lectromelt* equipment has been inspired by Northwestern's nineteen years of experience with these furnaces. As their demand for high quality steel rose throughout the years, they added Lectromelt Furnaces as you see here to produce that steel—efficiently, economically and with the high degree of uniformity they require.

Catalog #9 tells you about Lectromelt Furnaces. For a free copy, write Pittsburgh Lectromelt Furnace Corp., 323 32nd St., Pittsburgh 30, Pa.

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*REG. T. M. U. S. PAT. OFF.

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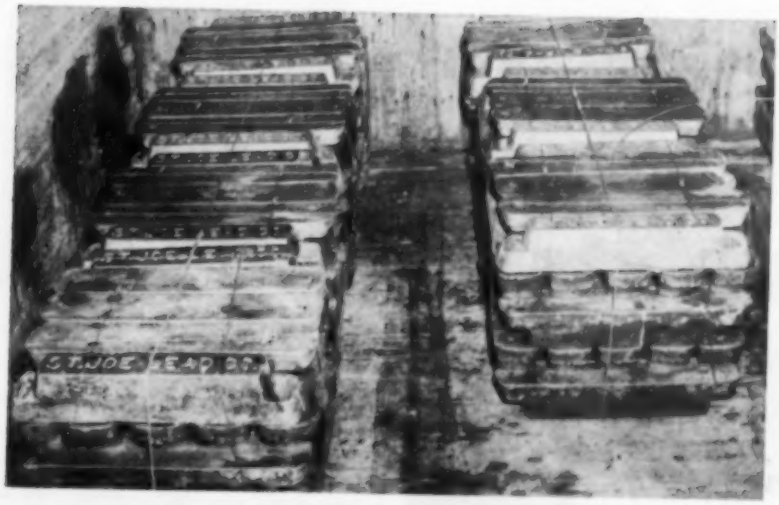
WHEN YOU MELT... *Lectromelt*



These 100-lb pigs may break and scatter, but . . .

St. Joseph Lead Co.

these 1-tonners will lie flat and in place as . . .

Lead Ingots Go King Size

SOMETHING NEW has been added to the lead industry. It's a 1-ton ingot which holds promise of significant economies in shipping and handling for those who can use it.

The ingot, which measures 23¾-in. square on top, 18½-in. square at the base and 10 in. deep, is being produced in quantity by St. Joseph Lead Co. at its Bunker Hill smelter, Bradley, Idaho, and at Herculaneum, Mo. One-third of Herculaneum's production this month will be in the king-size ingot. Others are either in early production or experimenting with the new size. All lead producers but one have the facilities to produce it, although not all smelters can handle it. One importer, realizing this will be new competition to meet, will turn out the new size, also.

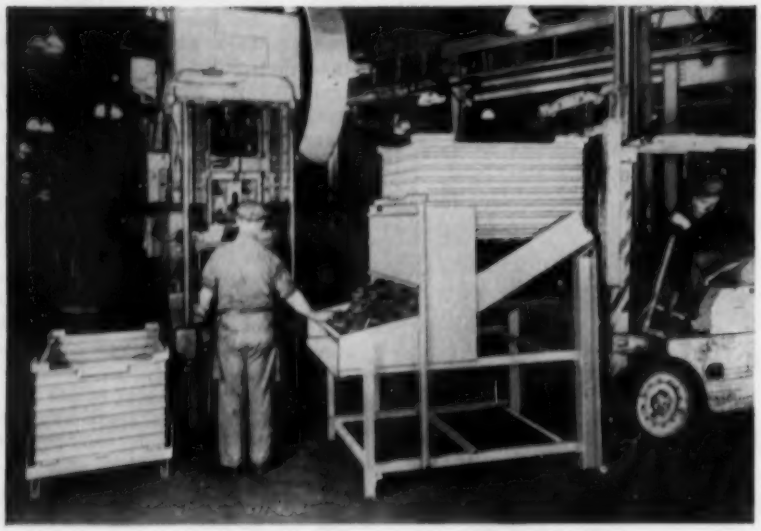
Development — For sometime the industry has been studying the possibility of a larger ingot than the standard 100-lb size. Consolidated Mining & Smelting Co., Trail, B. C., turned out a 1600-lb rectangular ingot on special order from a customer, but it could be lifted from only two directions by a standard fork lift truck. St. Joe experimented with a 2-ton ingot, but it proved too big. The design of the present 1-tonner allows a lift truck to tackle it from all four sides, which can mean economies in storage space and ease of handling.

But the main advantages of the new design come in shipping. The 100-lb pigs must be strapped for shipping, for which there is an extra charge. They are not interlocked, as in the case of zinc. Under rough conditions of handling and transportation, there is a good chance that the strapping will break and the pigs will tumble. That, in turn, requires time and manpower to restack them upon arrival, so that they can be unloaded. This can take as much as two days for a full shipment. With the 1-ton ingots, there is no such problem. They lie flat on the car floor with no strapping, and even the roughest handling results in a minimum of dislocation and no tumbling. Upon arrival at the buyer's platform, a lift truck can unload easily the whole shipment in one hour.

Drawback — The only trouble is that not all users of lead can benefit from the extra size. Only companies with large enough kettles and other equipment will find it of value. A fast melting cycle will freeze up the kettle if the size of the ingot is too big. The 100-lb pig will probably remain the standard size while the king size will be aimed only at large producers of such lead products as tetraethyl, cables, batteries and some pigments.

However, Charles R. Ince, vice president of St. Joe, says the large size is proving itself and his company is planning to increase its production. At present, St. Joe is making the ingots in individual molds, but it intends to put the large molds on a special casting wheel for automatic pouring. At first thought, it would seem that a savings could be effected on a quantity basis; that it would be cheaper to pour 2000 lb of lead at one time rather than 100 lb 20 times, something like the large "economy size" beverage or soap. But the king size ingot requires heavier equipment and longer cooling time, so that such quantity savings are practically negated. But the savings in handling, strapping and incidental traffic costs will make this a significant development for those who can use it.

Are high costs shrinking your profits?



Notice how the lift truck, Work-O-Matic drop-bottom skid box and positioning stand team up to save this workman's time and speed his output. Picture the possibilities in your own plant.

IF competitors are getting business that should have been yours . . . or if your profit margins are getting slimmer . . . it's time to be realistic about costs.

There's one way we *know* you can make substantial reductions in your costs. And that's by speeding production and increasing the output of production workers.

You can do this by using Work-O-Matic* material handling equipment.

Experience in all types of industries and operations has proved that the Work-O-Matics shown here will *reduce handling costs from 30 to 40%!*

Call our engineers in and let us prove that we can do the same in your operations. Fast work-level positioning with a constant flow of material—more work per man per shift—will more than offset higher wages. Your profit margin will improve and *you can capture more of your market.* Write for Catalog 83 describing Work-O-Matics. Address The Union Metal Manufacturing Company, Canton 5, Ohio.

*Patent No. 2,445,038. Other patents pending.

UNION METAL
Material Handling Equipment

Wire . . .

Wire Prices, Pages 132 & 133

Demand for merchant wire products is beginning to pick up seasonally, offsetting slackening movement of manufacturers wire reported at some points. Over-all, demand for wire products has not come up to mills' expectations, except for rods, with most items reportedly moving in disappointing volume at various points.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 130

Winter weather has cut down bar demand the past couple of weeks at several marketing centers. Volume is reported off noticeably. However, fabricators are in receipt of substantial new inquiry and anticipate prompt resumption of active buying as spring approaches.

On the West Coast fabricators report they are beginning to receive a heavy influx of inquiries stemming from government jobs. Considerable reinforcing tonnage is pending in the Pacific Northwest.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 131 & 132

Some April delivery tonnage is still available in cold-rolled sheets, but demand continues active and producers foresee a good second quarter. Not only does strong automotive business continue, but brisk inquiry from manufacturers of other consumer durables is coming in, a situation reflected also in enameling stock and electrical sheets.

Galvanized deliveries extend far ahead. Producers are taking care of regular customers even where second-quarter specifications have not been received. This is particulary true in the East but also is reported in the Midwest. Jones & Laughlin Steel Corp. has just placed a contract with Aetna-Standard Engineering Co. for a continuous galvanizing plant at Pittsburgh.

Chicago district mills still report pressure is unrelenting. Some are booked solid on cold-rolled and galvanized through first half. Recently hot-rolled orders have stepped up, too, resulting in lengthened deliveries.

In New England some buying for inventory is noted, possibly as a hedge against a possible price increase around midyear. In that market most sellers are more extended on stainless strip than on carbon.

Second quarter sales of cold-rolled sheets may fall under first quarter tonnage in the opinion of some Pittsburgh producers.

Some

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Steel Bars . . .

Bar Prices, Page 130

Bar consumers appear to be showing a little more concern over forward supplies. Business in cold-drawn material is fairly active and more ordering for advanced positions, April and May, is noted. Substantial hand-to-mouth business in hot-rolled carbon bars also is reported.

The improvement in buying seems fairly general as to product category, hot-rolled carbon and alloy, and cold-drawn carbon and alloy. The pickup even extends to rail steel bars, bar shapes and bands.

Explanation for the slight, yet noticeable, upturn in bars, which have lagged behind other major steel products over recent months, is difficult to define. Automotive demand bulks large, of course, but it appears consumers in general are becoming more inclined to protect forward needs.

To what, if any, extent the Formosa crisis is a factor in the pickup remains to be determined. In New England demand for alloy bars is sustained by small arms and government contracts. But there is relatively little ordering of shell parts and the like at present. This situation, however, could change rapidly should the Formosa situation develop into a shooting affair. Bars are widely used in munitions.

Plates . . .

Plate Prices, Page 130

Tone of the plate market is definitely stronger. Both in the East and Midwest demand is better than it has been in months. Some producers are specifying longer deliveries. One Chicago platemaker now lists sheared and universal mill plates at four weeks shipment, against three to four only a week or so ago.

While some trade observers think the second quarter may find plates in almost as tight supply as sheets, this view is far from universal. Actually, eastern mills can make shipments within two weeks; and, it is pointed out, apart from Navy buying for maintenance and repair plus stockpiling, shipwork remains light. Railroad needs continue far from brisk despite some recent improvement in car orders. Outlook is that about 5000 more cars will be built this year than in 1954.

At the same time, however, the pickup in export sales is encouraging while threatening international developments possibly may quicken interest in second quarter requirements on defense account.

Plate mills are losing substantial tonnage for light storage tanks to producers of heavy sheets.

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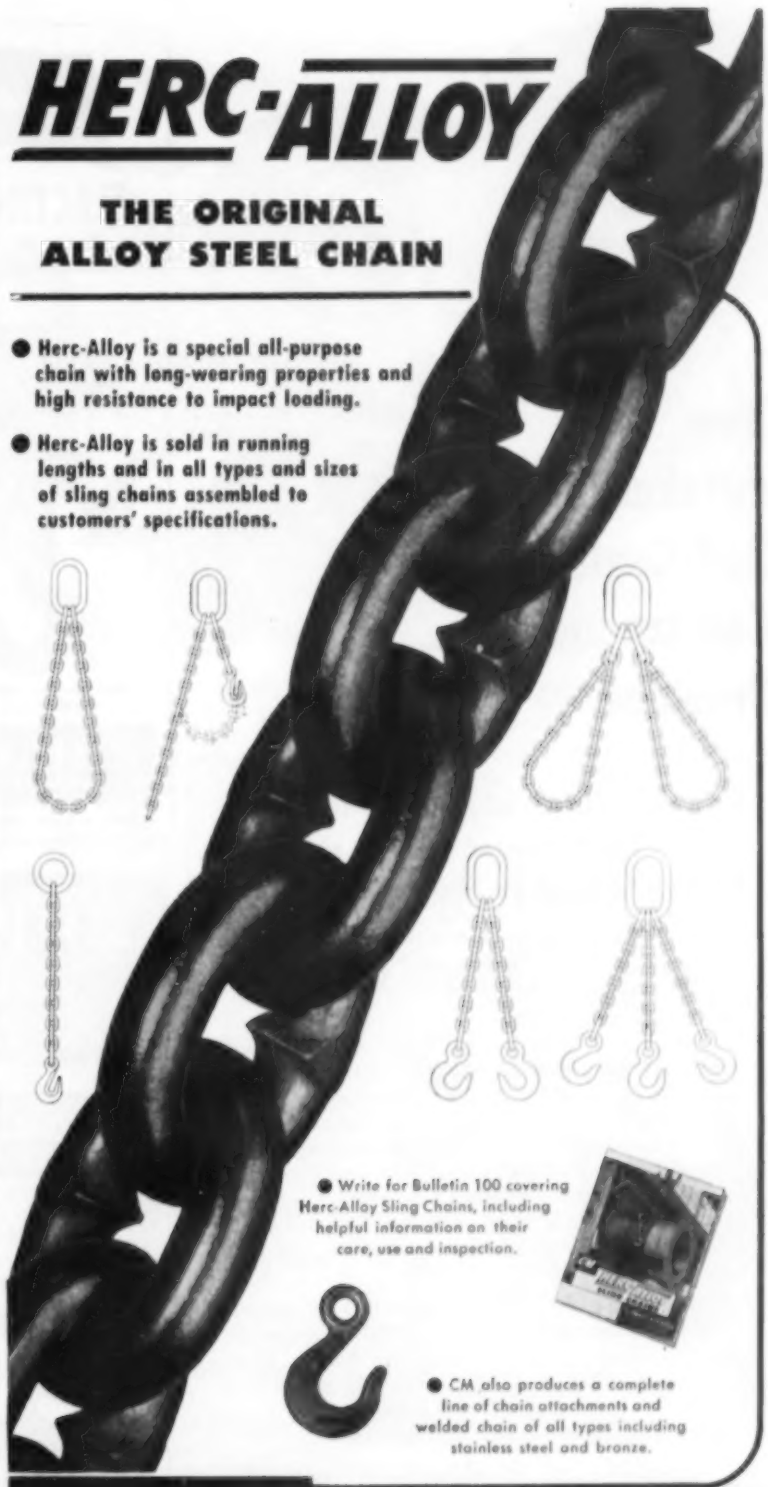

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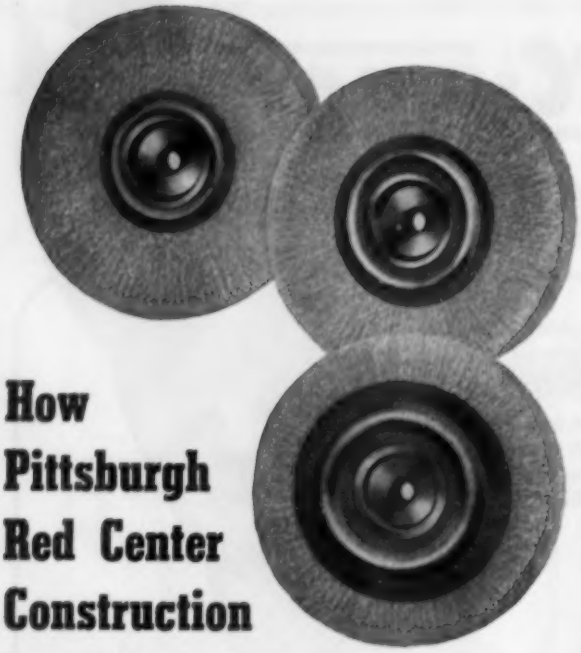

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Faster cutting while maintaining smooth finish • Freedom from shedding • Perfect balance • Longer life

In conventional brushes, when faster cutting action is desired, coarser wire is used. But increasing the wire gauge causes brittleness, destroying the wearing quality of the brush, and resulting in excessive scoring of the work.

Pittsburgh has solved this problem by maintaining the same ideal gauge wire in every brush, but increasing the fill and diameter of the hub and center plate of brushes designed for faster cutting. Thus, although cutting speed is increased, work remains unscored and the wire does not lose its inherent power to flex. These Red Center brushes last longer, maintain perfect balance throughout life, and do a better job all around.

This is just one example of superior Pittsburgh construction, engineered for both general and specific applications. For details of the complete line, write for free Catalog #54-W. Address: PITTSBURGH PLATE GLASS CO., *Brush Div.*, Dept. O-2, 3221 Frederick Ave., Baltimore 29, Maryland.

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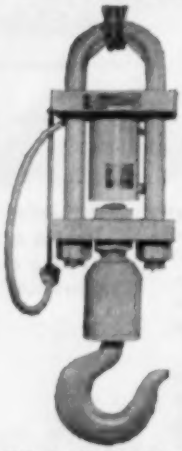

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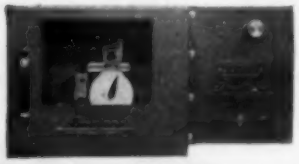

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Structural Shapes . . .

Structural Shape Prices, Page 130

Cold weather slowed construction activities at some points, but new inquiry for structurals is coming out steadily. Job estimating continues brisk.

Structural schedules appear to be tightening somewhat, notably in the East where increased buying for export lends to the market support provided by sustained domestic demand. In general, fabricators have no difficulty obtaining steel. As a rule, deliveries are available in three to four weeks.

Highway and other public work dominates the market but a greater diversity of industrial jobs is developing. Most fabricating shops are in comfortable position, many being booked up several months ahead. Competition, nevertheless, continues sharp. At Pittsburgh, fabricators and constructors are building stocks.

Kaiser Steel Corp. has entered the steel fabrication and erection field through the purchase of the Union Steel Co., Los Angeles. Also, Consolidated Western Steel Division, U. S. Steel Corp., has entered the field of guard rail fabrication, recently booking a contract for more the 21,000 ft of guard rail.

Tubular Goods . . .

Merchant steel pipe demand is much better than it was a year ago at this time. To some extent this reflects more confidence in building prospects for the months ahead, as compared with sentiment last winter. Also, excess inventories in the hands of many distibutors appear to have been pretty well worked off, though price cutting at the jobber level still is in evidence.

Seasonal pickup in cast iron pipe requirements is noted. Pacific Northwest area bid openings currently are numerous.

Stainless Steel . . .

Production of 259,191 net tons in the fourth quarter of 1954 raised total output of stainless and heat resisting steel ingots for all of the year to 824,117 net tons, according to the American Iron & Steel Institute. The 1953 total was 1,015,303 tons, of which 178,900 tons were produced in the closing quarter.

As in other years, production of the 430 type was largest, amounting to 231,173 tons. In 1953 it was 413,170.

Allegheny Ludlum Steel Corp., Pittsburgh, reports the sharp increase in demand for stainless products, beginning in late 1954, is expected to continue this year.

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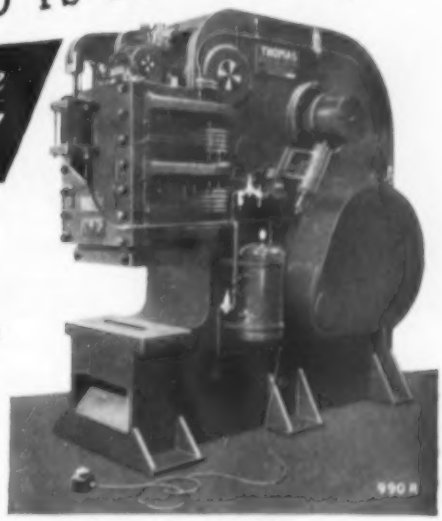
- Quick Tool Changes



This Thomas All-Steel Punch or Shear has shearing or punching attachments which may be interchanged in a matter of minutes

For rounds, squares, flats, angles or channels

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MACHINE MANUFACTURING COMPANY
PITTSBURGH (23), PA.

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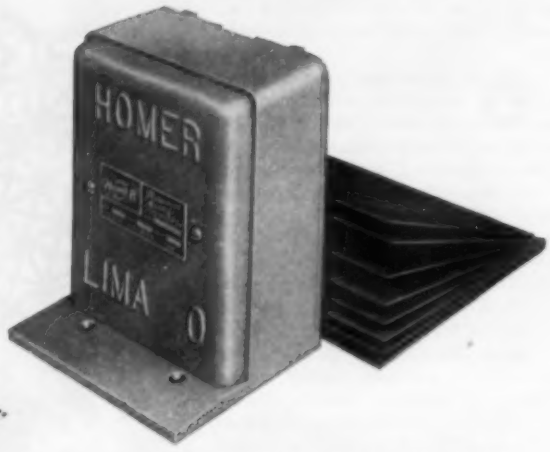
an absolute essential for the sheet metal trade

Make it easier, faster and safer for employees to handle round, square, nested, irregular or odd shaped stacks of steel sheets—in shearing, welding, pressing, riveting or similar production operations. Prevent double feeding of sheets—protect dies and machinery. Oily, polished, enameled or painted sheets separated without prying, scratching or marring the surfaces.



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- **GUARANTEED** —Magnetic strength guaranteed for life.
- **NON ELECTRIC** —Accidental shocking impossible —100% safe in hazardous locations.
- **EASY TO USE** —Requires practically no set-up time—it's ready to go anywhere it's placed.

For complete information on HOMER Magnetic Sheet Separators—we suggest you write today for Bulletin SS-210.

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DEPT. 149 LIMA, OHIO

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BROWNING ELECTRIC
TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY
VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

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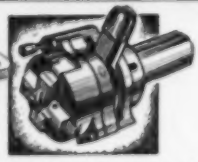

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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Pacific Coast Representative: *A. C. Berbringer, 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada*

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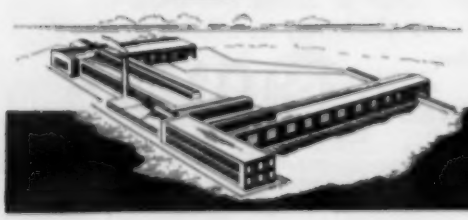

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SPRING CITY PENNSYLVANIA

Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 65-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign, Wolframite, good commercial quality	$25.00-$26.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

(Rail nearest seller)

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$3.35-$3.85
60-65%	4.00-4.35

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa., $130; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.80; Wellsville, O., $61.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.20.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $256; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $149.80; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¼-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., Ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa. ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

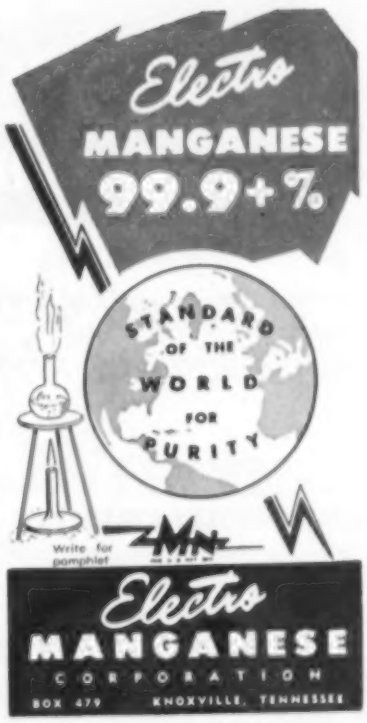
Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Per 100 lb
Inches		
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5¼	40	28.25
6	60	25.50
8, 9, 10	60	22.75
12	72	22.25
16	72	21.50
17	60	22.00
18	72	21.50
	CARBON	
40	100	$9.50
40, 38	110	9.50
30	84	9.75
24	96	9.60
24	72, 84	9.85
20	90	9.65
20	84	9.85
17	72	9.85
17	60	10.25
14	72	10.25
14, 12, 10	60	11.10
8	60	11.40



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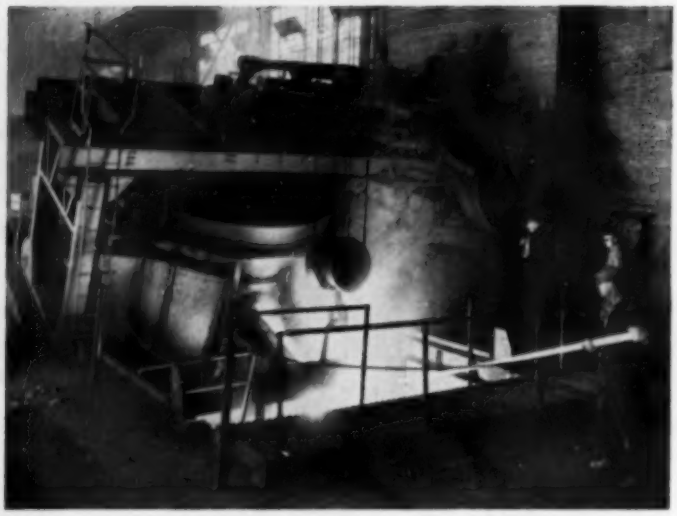

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STANDARD WIDTHS 11½" — 15" — 18" — 24". LENGTHS TO SUIT REQUIREMENTS

Work can be held momentarily for adjustment or inspection without cutting main drive. May be used on slight incline or decline. An extremely versatile power conveyor when fitted to your needs.

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ATlantic 1-6970

JOSEPH F. DUDDY, MANAGER

Scrap . . .

Scrap Prices, Page 148

Pittsburgh—A major steelmaker bought scrap for its Pittsburgh mill last week at prices $2 a ton above earlier quotations. The spread between local and out-of-district scrap remains, indicating difficulty of getting good scrap locally. Increases in quotations represent growing steelmaking activity and increasing demand from the East.

Cleveland—Steelmaking and foundry grades of scrap are stronger and higher in this area. The steel grades are quoted up 50 cents per ton and several foundry grades $1. The higher price on steelmaking items in part reflects strength resulting from a large purchase by a Pittsburgh mill of No. 1 heavy melting at $37 for local scrap and $39 for material delivered from outside the Pittsburgh area. Because of the favorable price paid, some Ohio and Michigan scrap will be attracted to Pittsburgh, bypassing Ohio mills.

Philadelphia—Steel Scrap prices have undergone a further increase on the basis of new sales. No. 1 heavy melting steel, No. 1 bundles and No. 1 busheling are now quoted $37, delivered, and No. 2 heavy melting $34. No. 2 bundles are quiet and unchanged at $28.

Several other grades are quoted higher, including cast iron items.

Bulk of activity is in the open-hearth grades. This is due to better domestic buying and continued brisk export movement. About 60,000 tons of open-hearth material is scheduled to leave this port in February.

New York—Scrap brokers have advanced buying prices $1 per ton on No. 1 heavy melting and No. 1 bundles to $30-$31, and No. 2 heavy melting to $27-$28. Also prices were increased on No. 2 bundles to $23-$23.50.

Prices Unchanged

FERROALLOY and pipe quotations, stainless, clad and tool steel prices remain unchanged. Current price schedules on these products were published in full on pp. 180 and 190 in the Feb. 7 issue of STEEL.

Buffalo—Prices on No. 1 steel grades of scrap jumped $2 per ton last week, equaling the rise in other grades posted the week preceding. Mill buying is expected shortly.

Cincinnati—Brokers are shipping at prices set by one mill in this area. A second mill consumer is not buying. Little material is moving by river, which means dealers are holding tonnage for local consumption.

Detroit—Scrap iron and steel prices are unchanged here, although the undertone of the market is strong. Demand from Pittsburgh and Youngstown is reported here.

Chicago—The scrap market tone here is easier, but prices are steady. Buying is light. Confusion over the price of No. 1 heavy melting and No. 1 factory bundles continues. Buying prices of two important mills are still $1 apart on these items.

St. Louis—High degree of selectivity continues in the scrap market. Last week rail rerollers, formerly a premium item, dropped $1.50 per ton, partly because one mill shifted to billet production. Clean auto cast is up $2.

Los Angeles—Steady purchases in January left district mill yards well stocked. Collections of auto scrap are 10 per cent above a year ago.

San Francisco—Exporters are paying more for steel scrap than currently posted mill prices. This is resulting in pressure on the latter.

Seattle—The scrap market is firm at $29 and $25 for No. 1 and No. 2 heavy melting steel, respectively. Supplies are adequate.

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automatic, high-speed
heavy-duty
WIRE STRAIGHTENING
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CUTTING MACHINES
Sizes for .012" to ¾" WIRE
ROUNDS & SHAPES
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Metal
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FOR USE IN BLAST CLEANING EQUIPMENT
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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Feb. 9	$36.33
Feb. 2	35.25
Jan. Avg.	34.95
Feb. 1954	26.91
Feb. 1950	27.52

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH
(Delivered consumer plant)

No. 1 heavy melting	*37.00-39.00**
No. 2 heavy melting	*34.00-36.00**
No. 1 bundles	*37.00-39.00**
No. 2 bundles	*30.00-32.00*
No. 1 busheling	*37.00-39.00*
Machine shop turnings	18.00-19.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Cut structurals, 3 ft lengths	*39.00-40.00*
Heavy turnings	33.00-34.00
Punchings & plate scrap	*41.00-42.00*
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	32.00-33.00
Heavy breakable cast	32.00-33.00
Unstripped motor blocks	22.00-23.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 3-ft and under	48.00-49.00
Rails, 18-in. and under	49.00-50.00
Rails, random lengths	44.00-45.00
Railroad specialties	41.50-42.50

Stainless Steel Scrap

18-8 bundles & solids	190.00-200.00
18-8 turnings	90.00-95.00
430 bundles & solids	85.00-90.00
430 turnings	60.00-62.00

*Low price represents local scrap.

CLEVELAND
(Delivered consumer plant)

No. 1 heavy melting	*33.50-34.50*
No. 2 heavy melting	*29.50-30.50*
No. 1 bundles	*33.50-34.50*
No. 2 bundles	*26.50-27.50*
No. 1 busheling	*33.50-34.50*
Machine shop turnings	17.00-18.00
Mixed borings, turnings	23.00-24.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	*33.50-34.50*
Cut structural plate 2 ft and under	*18.50-19.50*
Alloy free, short shovel turnings	*25.50-26.50*
Electric furnace bundles	*33.50-34.50*

Cast Iron Grades

No. 1 cupola	*43.00-44.00*
Charging box cast	*34.00-35.00*
Stove plate	38.00-39.00
Heavy breakable cast	*31.00-32.00*
Unstripped motor blocks	27.00-28.00
Brake shoes	*31.00-32.00*
Clean auto cast	43.00-44.00
No. 1 wheels	*40.00-41.00*
Burnt cast	*30.00-31.00*
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	44.00-45.00
Rails, 2-ft and under	*49.00-50.00*
Rails, 18-in. and under	*50.00-51.00*
Rails, random lengths	*44.00-45.00*
Cast steel	*37.00-38.00*
Railroad specialties	*38.00-39.00*
Uncut tires	*38.00-39.00*
Angles, splice bars	*43.00-44.00*
Rails, rerolling	52.00-53.00

Stainless Steel
(Brokers' Buying Prices)

18-8 bundles, solids	190.00-200.00
18-8 turnings	80.00-90.00
430 clips, bundles, solids	80.00
430 turnings	46.00-50.00

YOUNGSTOWN
(Delivered consumer plant)

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	32.00-33.00
No. 1 bundles	36.00-37.00
No. 2 bundles	27.50-28.50
No. 1 busheling	36.00-37.00
Machine shop turnings	18.00-19.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Low phos.	36.00-37.00
Electric furnace bundles	36.00-37.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00

CHICAGO

No. 1 heavy melting	33.00-35.00
No. 2 heavy melting	31.00-32.00
No. 1 factory bundles	35.00-36.00
No. 1 dealer bundles	33.00-34.00
No. 2 bundles	24.00-25.00
No. 1 busheling	33.00-35.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3 ft	37.00-38.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	39.00-41.00
Stove plate	34.00-35.00
Unstripped motor blocks	28.00-29.00
Clean auto cast	44.00-45.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	44.00-45.00
Rails, 2-ft and under	48.00-49.00
Rails, 18-in. and under	49.00-50.00
Angles, splice bars	43.00-44.00
Rails, rerolling	49.00-50.00

Stainless Steel Scrap

18-8 bundles & solids	180.00-195.00
18-8 turnings	95.00-100.00
430 bundles & solids	80.00-85.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange
(Week ended Feb. 9)
No. 1 Heavy Melting

	High	Low	Close
Mar.	....	....	37.00*

Sales (40-ton Units): None.
*Nominal.

DETROIT
(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.50
No. 2 heavy melting	22.00
No. 1 bundles	28.50
No. 2 bundles	20.00
No. 1 busheling	27.50
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	17.00
Punchings & plate scrap	30.00

Cast Iron Grades

Charging box cast	27.00
No. 1 cupola	34.00
Stove plate	30.00
Heavy breakable	25.00
Unstripped motor blocks	20.00
Clean auto cast	38.00
Malleable	30.00

CINCINNATI
(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	31.00-32.00
No. 2 bundles	*21.50-22.50*
No. 1 busheling	31.00-32.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	*18.00-19.00*
Short shovel turnings	19.00-20.00
Cast iron borings	*18.00-19.00*
Low phos. 18-in.	35.00-36.00

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast	35.00
Charging box cast	34.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18-in. and under	*47.00-48.00*
Rails, random lengths	*39.00-40.00*

PHILADELPHIA
(Delivered consumer plant)

No. 1 heavy melting	*37.00*
No. 2 heavy melting	*34.00*
No. 1 bundles	*37.00*
No. 2 bundles	28.00
No. 1 busheling	*37.00*
Electric furnace bundles	*37.00-38.00*
Machine shop turnings	*21.50*
Mixed borings, turnings	20.00
Short shovel turnings	*24.00*
Structurals & plate	38.00-39.00
Heavy turnings	*34.00*
Couplers, springs, wheels	*39.00**
Rail crops, 2 ft & under	*51.00*

Cast Iron Grades

No. 1 cupola	*35.00-36.00*
Malleable	*44.00*
Heavy breakable cast	*37.50-38.00*
Drop broken machinery	44.00

*Nominal.

NEW YORK
(Brokers' buying prices)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*27.50-28.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*23.00-23.50*
Machine shop turnings	*12.00-13.00*
Mixed borings, short turnings	*13.00-14.00*
Short shovel turnings	*14.00-15.00*
Low phos. (structural & plate)	31.00-32.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	22.00-23.00

Stainless Steel

18-8 sheets, clips, solids	175.00-180.00
18-8 borings, turnings	80.00-85.00
430 sheets, clips, solids	55.00-60.00
410 sheets, clips, solids	45.00-50.00

BOSTON
(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.50-26.50
No. 2 heavy melting	*22.00-22.50*
No. 1 bundles	25.50-26.50
No. 2 bundles	*18.00-18.50*
Mixed borings, turnings	10.00-11.00
Machine shop turnings	9.00-10.00
Short shovel turnings	11.00-12.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	32.00-33.00

BUFFALO

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	27.50-28.50
No. 1 bundles	*32.00-33.00*
No. 2 bundles	25.50-26.50
No. 1 busheling	*32.00-33.00*
Machine shop turnings	18.50-19.50
Mixed borings, turnings	20.50-21.50
Short shovel turnings	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	33.50-34.50

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	36.00-37.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

BIRMINGHAM

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	27.00-28.00
No. 2 bundles	19.00-20.00
Cast iron borings	16.00-17.00
Short shovel turnings	16.00-17.00
Machine shop turnings	15.00-16.00
Electric furnace bundles	29.00-30.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	33.00-34.00
Structural plate, 2 ft	33.00-34.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18-in. and under	40.00-41.00
Rails, rerolling	42.00-43.00
Angles, splice bars	38.00-39.00
Stand. steel axles	35.00-36.00

ST. LOUIS
(Brokers' buying prices)

No. 1 heavy melting	31.00
No. 2 heavy melting	29.00
No. 1 bundles	31.00
No. 2 bundles	24.50
Machine shop turnings	15.00
Short shovel turnings	17.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	32.50
Heavy breakable cast	32.50
Unstripped motor blocks	32.50
Brake shoes	30.00
Clean auto cast	41.00
Stove plate	36.50

Railroad Scrap

No. 1 R.R. heavy melt.	35.50
Rails, 18-in. and under	46.00
Rails, random lengths	40.00-41.00
Rails, rerolling	*47.50*
Angles, splice bars	40.00-41.00

SEATTLE
(Delivered consumer plant)

No. 1 heavy melting	29.00
No. 2 heavy melting	25.00
No. 1 bundles	21.00
No. 2 bundles	18.00
No. 3 bundles	14.00
Machine shop turnings	12.00-14.00
Mixed borings, turnings	12.00-14.00
Short shovel turnings	12.00-14.00
Electric furnace, No. 1	32.00-34.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	32.00-35.00
Heavy breakable cast	23.00
Unstripped motor blocks	25.00
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap
(Delivered consumer plant)

Rails, random lengths	30.00-34.00

LOS ANGELES

No. 1 heavy melting	28.00
No. 2 heavy melting	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings	8.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	24.00
No. 2 heavy melting	20.00
No. 1 bundles	23.00
No. 2 bundles	18.00
No. 1 busheling	24.00
Machine shop turnings	6.00
Mixed borings, turnings	6.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.
(Delivered prices)

No. 1 heavy melting	28.50
No. 2 heavy melting	25.00
No. 1 bundles	28.00
No. 2 bundles	23.00
Mixed steel scrap	22.00
Mixed borings, turnings	12.00
Rails, remelting	37.00
Busheling, new factory:	
Prepared	26.00
Unprepared	22.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

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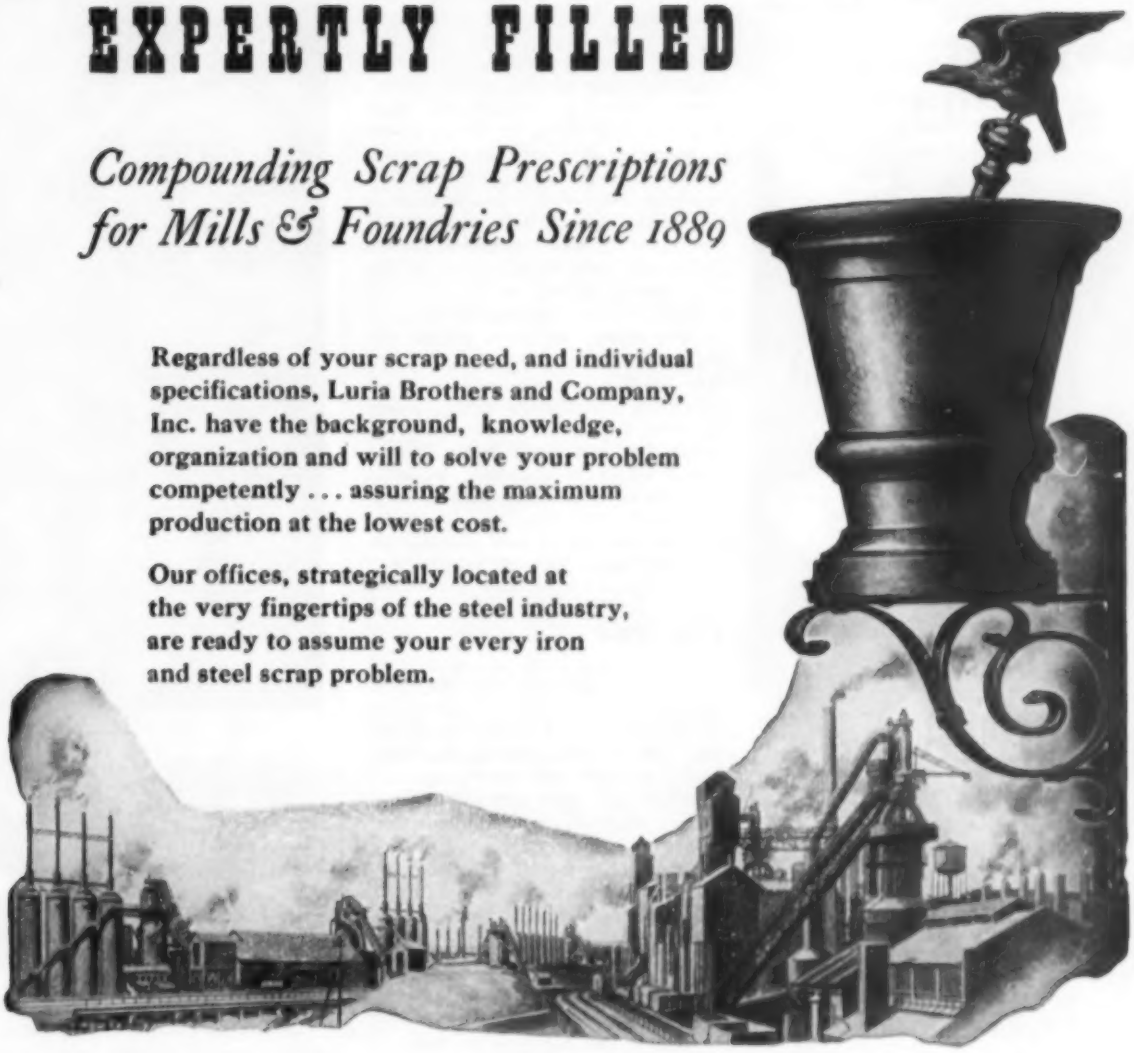

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"America's Best-Known Jobbing Stampings Manufacturer"

Warehouse . . .

Warehouse Prices, Page 134

Bookings of steel distributors continue to rise. All types of sheets are in strong demand, and plates are rapidly moving into that category. Price shading in slow moving products, including tubing, still is noted.

Distributors in Philadelphia have made another move to reduce losses in handling, especially small quantities. As noted recently, new extras apply on hot-rolled alloys in quantities of less than 300 lb. New extras now apply on stainless sheets, plates, angles and bars in quantities of less than 100 lb: 24.75c on lots from 50 to 99 lb; 34.75c on quantities under 50 lb. Previously, an extra of 21c applied in most instances on lots of less than 100 lb.

District distributors are considering new extras on small quantities under the "hot-rolled group pricing plan," which is in effect in some districts covering bars, shapes, strip, sheet and plates. They also are studying the question of new quantity extras on small lots of cold-finished bars.

Pig Iron . . .

Pig Iron Prices, Page 134

Merchant pig iron business shows further modest improvement, with consumers of No. 2 foundry replenishing reserves. Foundries serving automotive requirements have good order backlogs, but most jobbing shops are getting business hand-to-mouth.

Wheeling Steel Corp. will blow in its blast furnace at the Benwood, W. Va., Works soon. This furnace has been relined and rebuilt.

Tool Steel . . .

Shipments of high speed and tool steel (excluding hollow drill steel) totaled 84,143 net tons in 1954, reports the American Iron & Steel Institute. This compared with 116,152 tons shipped in all of 1953.

December movement amounted to 7464 tons, compared with 7158 in the preceding month and with 8069 in December, 1953. Shipments were the largest for any month since March when the total was 8454 tons.

Semifinished Steel . . .

Semifinished Prices, Page 136

Exports of semifinished steel to Europe are bolstering high demand for ingots, billets and slabs. Pittsburgh area export tonnage in these products is reported at highest level in two years. One eastern mill has orders for many thousands of tons of slabs to be exported over the next several months.

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PLATES . . .

PLATES PLACED

1775 tons, 25-ft (36 and 20-in.) water supply line, Anacortes, Wash., to American Pipe & Construction Co., Portland, Oreg., low $11.90 and $5.87 per foot respectively; Carey & Kramer, Seattle, engineers.

400 tons, tanks and digesters, Weyerhaeuser Timber Co. pulp plant, Longview, Wash., to Chicago Bridge & Iron Co., Seattle.

310 tons, 2-million-gal standpipe, York Water Co., York, Pa., to Hammond Iron Works, Warren, Pa.

PLATES PENDING

11,000 tons, hull, black, uncoated; bids Feb. 14, General Store Supply Depot, Navy, Philadelphia.

285 tons, elevated water tank for Vancouver, Wash.; H. D. Fowler Inc., Seattle, low.

200 tons, Navy; bids Feb. 18, General Stores Supply Office, Philadelphia.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5000 tons, office building, Connecticut General Life Insurance Co., Bloomfield, Conn., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Turner Construction Co., New York, general contractor.

1500 tons, cantilever hangar, Pope Airfield base, Fort Bragg, N. C., to Bristol Iron & Steel Co., Bristol, Va.; J. W. Bateson Co., Inc., Dallas, Tex., general contractor.

550 tons, addition, Wayne Pump Co., Salisbury, Md., to Dietrich Bros., Baltimore.

500 tons, 3-span continuous riveted plate girder bridge, Farmington river, East Granby-Simsbury, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Brunalli Construction Co., Southington, Conn., general contractor.

425 tons, Denali highway bridge, Alaska, to Pacific Car & Foundry Co., Seattle; Peter Kiewit Sons Co., Seattle, general contractor.

380 tons, buildings, two contracts, Air Force base, Portsmouth, N. H., to Lyons Iron Works, Manchester, N. H.; Davison Construction Co., Manchester, general contractor.

275 tons, Coca Cola plant, Washington, D. C., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

200 tons, warehouse, Northwest Metals Co., Auburn, Wash., and log haul for Snoqualmie Falls Lumber Co., Enumclaw, Wash., to Leckenby Structural Steel Co., Seattle.

200 tons, bottling plant, Fitzgerald Bros., Troy, N. Y., through R. D. Golden Inc., general contractor, to the Schenectady Steel Co., Schenectady, N. Y.

STRUCTURAL STEEL PENDING

5300 tons, superstructure, Missouri river bridge, contract 2, Kansas City, Mo.; bids Feb. 15, director of public works, Kansas City.

2075 tons, 10 bridges, Massachusetts turnpike, Framingham, Mass.; M. DeMatteo Construction Co., Quincy, Mass., low, general contract.

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240" Vertical Boring Mill

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CLASSIFIED

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FORGING ENGINEER AVAILABLE. Over thirty years experience in all phases of drop forge production, engineering and management. Reply Box 204, STEEL, Penton Building, Cleveland 13, Ohio.

ENGINEER in close contact with constructors and operators of industrial furnaces in 100-mile radius of Pittsburgh interested sales with manufacturer of alloy castings, fire brick, insulation, or other pertinent equipment. Experienced; know steel plant operation. Reply Box 214, STEEL, Penton Building, Cleveland 13, Ohio.

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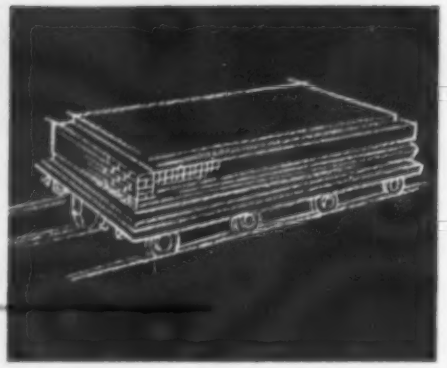

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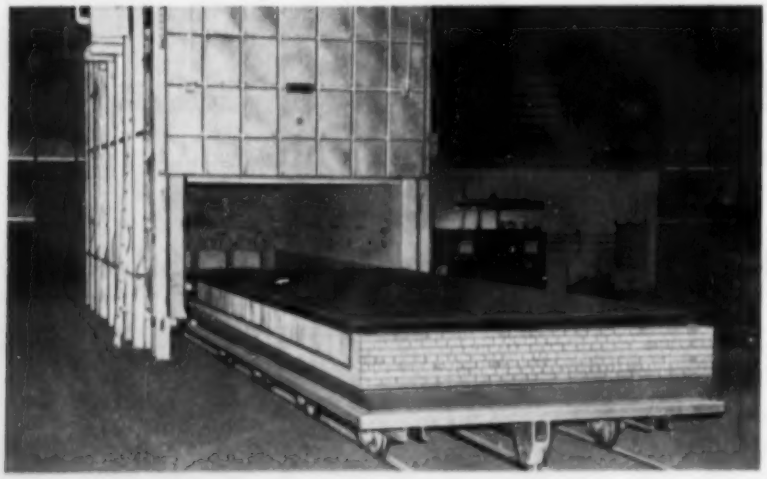

1440 tons, single composite, 2-span composite and 6-span composite beam bridges, latter over New Haven railroad, West Haven, Conn.; Mariani Construction Co., New Haven, Conn., general contractor; also 475 tons, reinforcing bars.

1050 tons, state bridge work, route 42, section 12-B, north-south freeway, Camden county, N.J., new bids Feb. 24; also required are 387 tons of reinforcing steel.

745 tons, six bridges, Massachusetts turnpike, Grafton-Millbury, Mass., bids Feb. 23, Boston; project also takes 715 tons reinforcing steel.

675 tons, four state bridges, White Mountain highway, Ossipee-Tamworth, N. H., bids Feb. 24, Concord, N. H.; project also takes 135 tons reinforcing and 235 tons steel bearing piling.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, addition, Seattle's Gorge dam, Skagit project, to Bethlehem Pacific Coast Steel Corp., Seattle; Merrit, Chapman & Scott, New York, general contractors.

650 tons, medical-surgical building, state hospital, Dorchester District, Boston, to Bethlehem Steel Co., Bethlehem, Pa., through John Bowen Co., Boston, general contractor.

400 tons, research center building, Yale University, New Haven, Conn., to Concrete Steel Co., Boston; George B. H. Macomber Co., Boston, general contractor.

REINFORCING BARS PENDING

1040 tons, 10 bridges, Massachusetts turnpike, Framingham, Mass.; M. DeMatteo Construction Co., Quincy, Mass., low, general contract.

950 tons, including mesh, highway, Richmond-Hopkinton, R. I.; bids Feb. 9, Providence, R. I.

665 tons, three bridges, Massachusetts turnpike, Chicopee, Mass.; Grand View Construction Co., Mt. Vernon, N. Y., low, general contract.

470 tons, five bridges, Massachusetts turnpike, Palmer, Mass.; bids Feb. 8, Boston.

387 tons, bridge work, route 42, section 12-B, north-south freeway, Camden county, N. J., new bids Feb. 24; also required are 1050 tons of structural steel.

300 tons, Bureau of Public Roads, Commerce Department, Washington; bids Feb. 18.

210 tons, widening bridge, Dorchester Bay, Morrissey boulevard, Boston; bids in.

200 tons, three bridges, Massachusetts turnpike, Becket-Otis, Mass

PIPE . . .

CAST IRON PIPE PENDING

428 tons, West Slope district, Portland, Oreg.; bids Feb. 14.

350 tons, 12, 8 and 6 in.; bids to Water Superintendent G. G. Paine, Everett, Wash., Feb. 14.

309 tons, housing project, Fort Lewis, Wash.; general bids to U. S. Engineer, Seattle.

275 tons, Tacoma, Toppenish and Wenatchee, Wash., also Anchorage, Alaska.

RAILS, CARS . . .

RAILROAD CARS PLACED

Alaska railroad, 100 multiservice, 70-ton hopper cars to Greenville Steel Car Co., Greenville, Pa., $954,400, through General Services Administration, Seattle.

Delaware & Hudson, 100 seventy-ton covered hopper cars, to the Pullman-Standard Car Mfg. Co., Chicago.

General Services Administration, Washington, 1650 narrow gage box cars, for Indian Railways, to the Huntington, W. Va., plant of ACF Industries Inc., New York; these are in addition to 1650 broad gage gondola cars to the Magor Car Corp., New York. The General Service Administration also awarded 1500 narrow gage car bodies and 500 broad gage car bodies to Metropolitan-Camel Carriage & Wagon Co., Birmingham, England. Contracts for the wheel and axle assemblies for the British-built bodies will be awarded separately.

Missouri Pacific, 650 box cars and 50 flat cars, to own shops at DeSoto, Mo.

St. Louis, Southwestern, 400 fifty-ton box cars to the Pullman-Standard Car Mfg. Co., Chicago.

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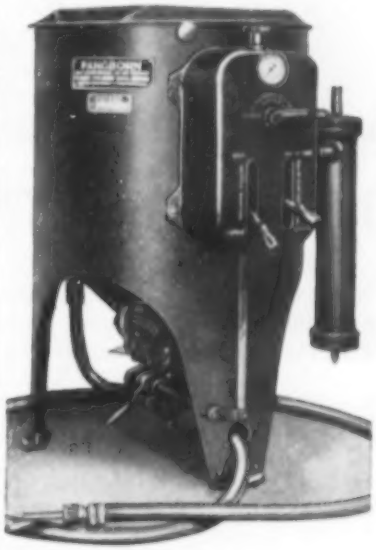

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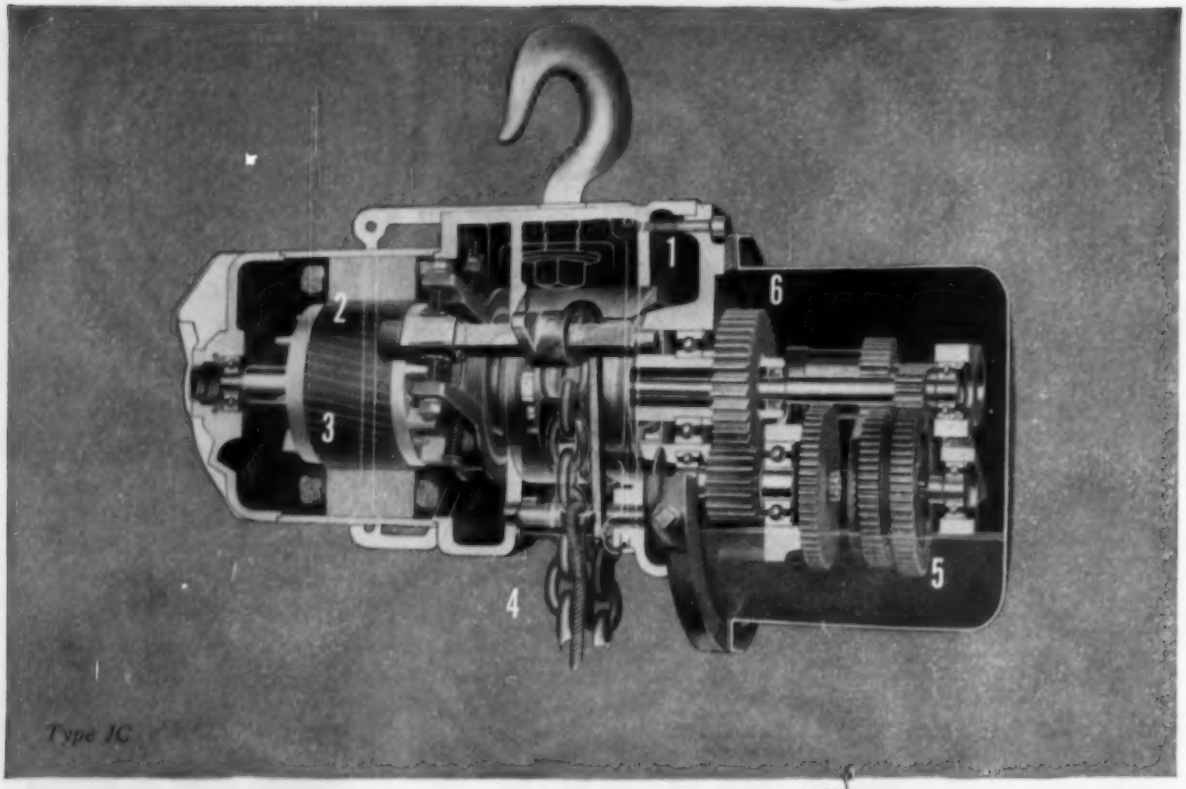

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Why Allegheny Ludlum's improvement program features 130 TIMKEN® roll neck bearings

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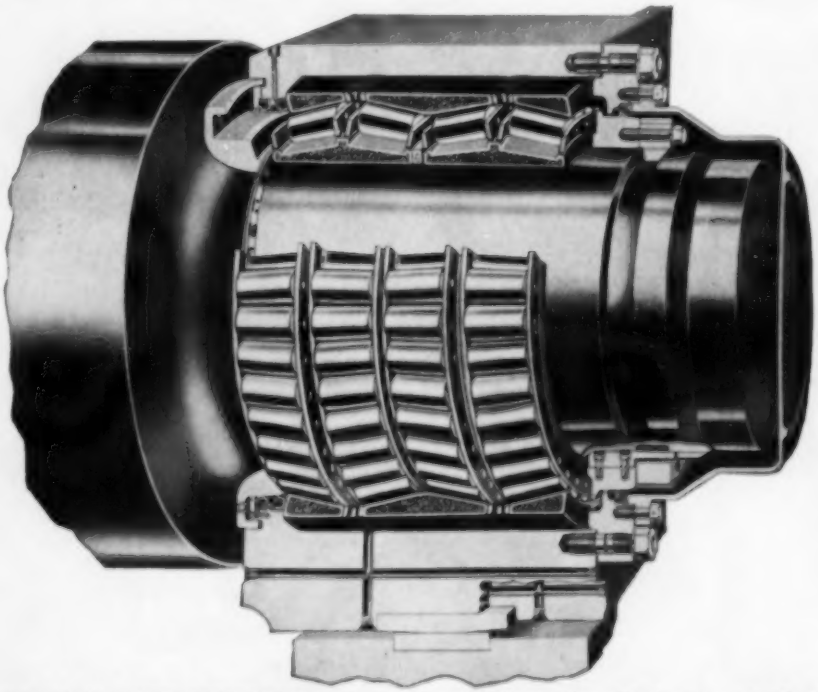
This symbol on a product means its bearings are the best.



ALLEGHENY LUDLUM STEEL CORPORATION *mounts work and back up rolls on Timken tapered roller bearings to get less friction, longer life. Typical Timken roll neck bearing application is shown in cutaway.*

IT'S TIMKEN BEARINGS FOR VALUE!

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$$Value = \frac{quality + service + public\ acceptance}{price}$$

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